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Dedicated to the memory
of
LORD LISTER
on
The Centennial of His Birth

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THE SURGICAL CLINICS OF NORTH AMERICA

Volume 7

No 5

FOREWORD

THE clinics in this volume have been contributed by fellows of the Pacific Coast Surgical Association. This association is composed of surgeons living in California, Oregon, Washington, and British Columbia.

These surgeons realize that what progress this volume may show in the science of surgery would be impossible, but for the great discovery and tireless effort of one man—Joseph Lister, the founder of modern surgery.

As this year is the centennial of his birth they wish gratefully to dedicate this volume as a tribute to his memory in appreciation of his inestimable gift to mankind, the far reaching significance of which will increase with time and endure forever.

EDGAR L. GILCREEST,
Secretary

SAN FRANCISCO CALIFORNIA

CONTRIBUTION BY
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UNIVERSITY OF CALIFORNIA HOSPITAL

"LORD LISTER AND THE RENAISSANCE OF SURGERY"

THE overwhelming magnitude of Lister's discovery, and the rare nobility of his life, make a dual appeal at once fascinating and inspiring. Only by studying what is accomplished in the span of one great life is it possible to realize how far and how fast we have traveled. Medicine, having sprung from magic, nourished in its swaddling clothes on empiricism, finally took its deep and permanent roots in science. And it is to pioneers like Lister, who unfalteringly helped it creep inch by inch through the maze of ignorance and superstition, that we owe our everlasting debt.

The large number of healthy people today, and the large number of old people today are living monuments to the discovery of Joseph Lister. By his principles of antiseptic surgery he has saved more lives than all the conquerors of the world ever destroyed. Yet, history always honors the destroyers of lives, but seldom pays tribute to the saviours of mankind.

What is it that has made the name of Lister a household word throughout the civilized world, and why do all nations and all creeds unite this year to honor his memory? Where was surgery before the days of Lister? Before him and his illustrious colleague, Pasteur, with whom his name will ever be affectionately associated, was gross darkness. Plague, pestilence, and famine were rampant upon the earth. It is true that surgery had been robbed of most of its pain, and thereby had received its

first great impetus by the discovery of ether anesthesia in 1842 by Crawford W. Long of Georgia of whom America should be justly proud and of chloroform anesthesia in 1847 by Sir James Simpson of Edinburgh but on account of the ravages of infection few surgeons cared to submit their patients to surgical operations



Lord Lister

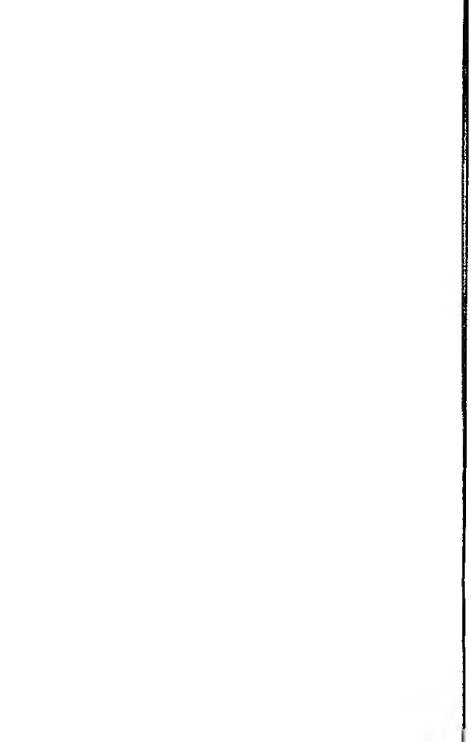
With the introduction of anesthesia the grim specter known as hospital gangrene loomed larger than ever. A picture ever vivid in my mind was painted by my father whose recital of his medical student days during the pre Listerian period depicted the deplorable conditions then prevailing in the hospitals. The wards were a pitiable sight filled with patients with flushed

faces, parched lips, suffering from septic fever, and often in delirium. Even the odor of gangrene, which pervaded the entire institution, was trying to all who ministered to those suffering from infections. How was this infection and gangrene, which was daily taking such a large toll in death, to be combatted?

This problem was in the minds of all surgeons at this time, when Louis Pasteur, of France, often spoken of as "the most perfect man who has ever entered the Kingdom of Science," appeared on the scene. In 1857 he read his epochal paper on lactic acid fermentation and on alcoholic fermentation, in which he laid the foundation of biologic chemistry and proved that spontaneous generation did not exist, as had been believed up to that time but that these fermentations were actually due to living organisms.

Lister was the first to recognize and appreciate the paramount significance of Pasteur's discovery of microbic activities, and its direct application to surgery. Applying the theories of germ life, enunciated by this great chemist, to the principles of surgery, Lister established antiseptic principles in operations and in the treatment of wounds which was to revolutionize the science of surgery, and make "possible the present proud perfection of this most brilliant of all the arts." Lister "saw the practical importance of the discoveries of Pasteur," as pointed out by Sir Clifford Allbutt, "because he was watching on the heights and he was watching there alone."

From this day on the dramatic episodes in surgery have captivated the imagination, and aroused admiration and wonder by the successful victories in the battle against infection. The romance of surgery is so fascinating and at the same time so logical, that no thinking person can fail to see at a glance the great benefits that have come from it—benefits more priceless than all the precious jewels of the world. Before the days of antiseptic surgery, amputations of limbs, for example, carried a mortality rate of 65 per cent compared with 4.5 per cent to day. Having served in three European wars I realize what this means to the wounded soldiers and to the nations at war. When we reflect that the eminent French surgeon Larry Chief



CLINIC OF DR. ROBERT C. COFFEY

DR. ROBERT C. COFFEY CLINIC AND HOSPITAL, PORTLAND, OREGON

CANCER OF THE PELVIC COLON AND RECTUM

IN discussing ideal operations for cancer of the rectum, and lower sigmoid colon, one is impressed with the great variation in the extent and location of the pathology, and the ingenuity required to meet these varying conditions.

When I first described the radical operation for carcinoma of the rectum, in which a permanent colostomy was established, superior hemorrhoidal artery tied, the fat in the hollow of the

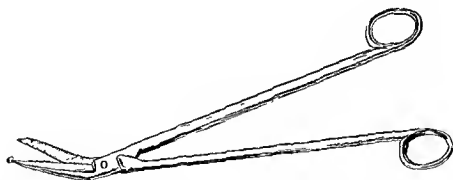


Fig 519 —Long-handled scissors for mobilizing pelvic colon.

sacrum along with the glands mobilized and pushed down or removed, the distal end of the severed sigmoid drawn out through the rectum to be removed at a later operation, it was very apparent this operation could be applied only to a limited group of cases of cancer of the rectum, namely, those cases in which the growth was located in the ampulla of the rectum proper, and was sufficiently early to permit the passage of the inverted sigmoid through the calibre of the growth. A very large group

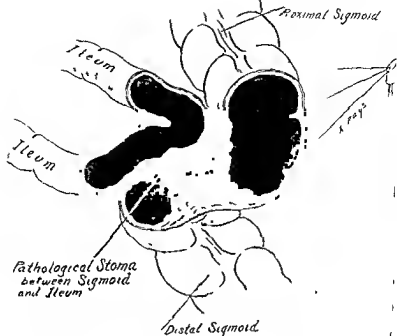


Fig 520 —Carcinoma of sigmoid with contact cancer of ileum, resulting in a pathologic ileocolostomy

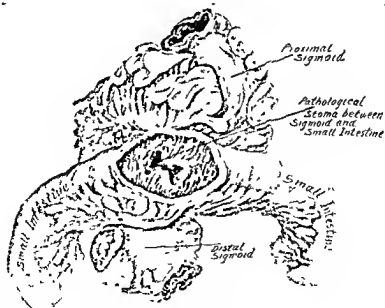


Fig 521 —Pathologic ileocolostomy resulting from a contact-cancer involvement of the ileum

in which the rectosigmoid is involved, and in which strictures takes place very early, must be left out of this class. Therefore, the radical operation, in which all the cancer-bearing area below the promontory of the sacrum must be removed, is not applicable in these cases without modification. To meet this condition, the operation has later been modified by mobilizing the rectum and

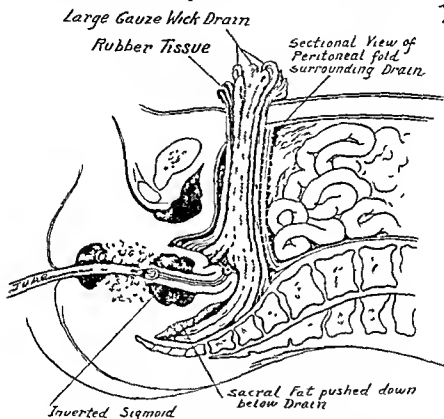


Fig 522—Completed first stage in advanced carcinoma of the rectum, Case IV. Rectal tube passed through lumen of growth, but would not follow through.

pelvic fat from the hollow of the sacrum and coccyx behind, and from the bladder and prostate in front, after which the rectum is severed well below the growth, cut between clamps, and the growth removed at the first operation. Another class in which the original operation does not apply is that in which the growth is located in the rectum proper, but in which the growth

is too far advanced to permit the inversion of the sigmoid through the lumen in the growth. There are a number of other conditions constantly coming up which make minor changes in technic necessary. I propose at this time to discuss seven consecutive cases as they occurred in my practice for the purpose of bringing out these points.

CASE I *

This patient is a female, aged sixty three, widow of a physician, admitted to the Portland Surgical Hospital May 8, 1927. Has been suffering from intestinal obstruction for two weeks, having gone through the stages of constipation and diarrhea prior to that time. For the past week she has had a total obstruction despite several drastic doses of physic which she has taken. During this week she has been vomiting first yellow bile but recently the vomitus is brown, thick, and of fecal odor. She is enormously distended. On attempting to use an enema, water immediately flows backward without entering the bowel. The finger does not reach the growth. Proctoscope shows the obstruction about 12 inches above the anus. Inasmuch as the patient was constantly vomiting and fluid could not be retained in the rectum, large quantities of saline solution were used subcutaneously and intravenously for forty eight hours. The stomach was cleared by giving quantities of water by mouth which was immediately vomited, the patient having an aversion to the stomach tube. After forty eight hours the abdomen was opened using a right rectus incision near the mid line. Description of the operation on May 9, 1927 is given in our records as follows:

Operative findings—Annular carcinoma of the sigmoid about 12 inches above the anus.

The liver is examined and found not to be involved by palpable metastatic growths. The sigmoid is enormously distended, very much thickened by its effort to propel its contents through a gradually increasing malignant stricture. The growth is firmly attached to the pelvic wall just back of and below the growth. The first impression is that the case is one particularly adapted

to the Mikulicz plan of operation so the peritoneum is split, and the growth mobilized from the pelvic fascia. In gradually drawing the growth up through the wound, it is noted that the left ureter comes up with it. By careful separation of the tissues, it is found that while the growth partially surrounds the ureter, the ureteral wall is not infiltrated, and the ureter is easily separated from the growth, and is allowed to drop back into its place. It is not dilated, and, therefore, we may assume that it has not been obstructed by the growth. Gradually the growth is mobilized, partially by separation with the finger, and partially by cutting of the peritoneum and other tissues. As it is mobilized, it is drawn upward through the abdominal incision. There are large lymphatics both above and below the growth. Large hard glands in the mesosigmoid can be felt well down in the hollow of the sacrum toward the coccyx. These glands move with the intestine. The fact that these glands are apparently involved so low down in the pelvis makes the Mikulicz operation impractical if we are to do a radical operation with any hope at all of permanent cure. There is no possibility of making an anastomosis with so short a stub of rectum, and furthermore there would, apparently, be no hope of cure if this plan were adopted. The patient is in a very bad state for a radical operation at this time, and yet in cases where the obstruction has come on gradually to completion in this way, such patients are very apt to develop a great degree of immunity. At any rate the circumstances are such that we must give the patient whatever chance there is for recovery.

The first step in the radical removal in this case is to seek out and ligate the superior hemorrhoidal artery as it crosses the promontory of the sacrum. With a long curved ligature carrier, two ligatures are placed around this vessel about $\frac{3}{4}$ inch apart. The artery is now severed between these two ligatures. The sigmoid arteries below this are doubly clamped, and cut, also, but not tied. All the mesosigmoid is severed down to the upper rectum. The fat in the hollow of the sacrum is mobilized down to the tip of the coccyx. The peritoneum and pouch of Douglas are opened and the intestine mobilized in front. Two clamps

are now placed on the rectum about 4 or 5 inches above the anus. The gland bearing fat which has been lifted from the hollow of the sacrum is removed as far as possible. After severing the rectum between the two clamps with the cautery the growth and proximal sigmoid are now lifted out and wrapped in gauze. Purse string is placed around the distal sigmoid or end of the rectum which is turned in. A rectal tube is inserted into the rectum. Heavy linen thread now attaches the inverted end of the rectum to the tube. By traction on this the upper end of the rectum is drawn out through the anus. There is no bleeding. The entire hollow of the sacrum has been denuded of fat. The peritoneum on the left side of the pelvis has also been removed and the left ureter lies bare. There is no possible way by which we can cover either the ureter or the surface of the sacrum with peritoneum. There are enlarged glands almost the entire length of the mesosigmoid. It is barely possible that the highest ones may not be malignant even though they are enlarged. We will remove them as far as possible and will bring out a considerable length of intestine through the abdominal incision for the reason that on the left side there is not sufficient peritoneum to close the space. Furthermore the making of a separate incision and bringing the colon out through a separate colostomy will add materially to the length of time required, and this patient is not able to stand any further operation so I bring this distended sigmoid out through the upper angle of the incision (the procedure suggested by Samuel Mixter). I will try to leave several inches protruding so that when the bowel is opened the contents will be delivered some distance away from the wound. The cut peritoneal edges of the mesosigmoid are brought together with suture and a large roll of gauze wicks already in place two sheets of four ply rubber tissue are draped. This leaves a very large cigarette drain including 24 small wicks which will rapidly take out the exudate in this part of the pelvis. The uterus is in front of the wicks but we are able to use the broad ligaments to form a peritoneal tube for our drainage. But before we start to close this we note a

serious difficulty, viz, there is a large amount of peritoneum absent from the left wall of the pelvis, and the left ureter is exposed. This we cannot cover with peritoneum, so we take another sheet of four ply rubber tissue, and carefully place it so as to cover the ureter and this raw surface entirely. This will prevent the intestines from uniting to this raw surface. Now we reach to the site of our large drain, and bring the elements of the broad ligaments, including the tubes and the round ligaments backward around this drain, and sew them together. We also sew them to the edge of the mesosigmoid, where it has been turned upward. In this way we are able to close all the raw surfaces with peritoneum, except the part which is covered with this piece of rubber tissue. The proximal sigmoid is now drawn through the incision, but it is found that it is not practical to bring the intestine to the upper angle of the incision which is about an inch above the umbilicus. We have found that a colostomy bag works best about an inch below the umbilicus so we will bring the colon out at this point. It will be noted that there is pulsation in the small vessels as they come to the intestinal wall. Therefore, our circulation is good. The abdominal wall is now closed between the drain and intestine, and also above the exit of the intestine. We will leave the clamp on for a few hours twenty four hours if possible, and will then cover the wound with a collodion dressing. After the dressing is dry, the clamp will be removed and the bowel allowed to empty."

Patient left the table in fairly good condition, pulse was 120. Large quantities of water were used under the skin. The vomiting being less than before the operation clamp was allowed to remain on for twenty four hours and was then removed. Certain amount of bloody stool passed away with some gas. Nausea ceased soon after the removal of the clamp. On the third postoperative day a formed stool passed. On the fourth postoperative day castor oil was given, after which paraffin oil was used to keep the bowels regular.

Microscopic examination of the removed intestine was made with the following pathologic diagnosis "Adenocarcinoma of the rectum with metastases to regional lymph glands."

On May 24th sixteenth postoperative day the stub of the rectum was removed through a perineosacral wound. This was a longer interval than usual between operations but the growth had been removed and there was no particular hurry. The patient was weak from her long illness. Microscopic sections of the piece of large intestine and rectum showed the following.

A marked inflammatory infiltration with congestion and proliferation of connective tissue. There is no evidence of any malignancy.

Her convalescence was stormy in many respects. About the third postoperative week she developed a severe bronchitis and an irregular heart and at times became very cyanotic during spells of coughing. This bronchitis lasted for approximately six weeks. On the fifty seventh postoperative day attention was called to an enlargement on the mesenteric side of the colostomy. It was hard and upon incision the lump was found to be quite solid. While the wound was open 50 mg of radium heavily screened were placed in the wound for twenty hours for the purpose of treating the mesentery of the sigmoid which we feared might have involved glands. On the sixty third postoperative day patient had a severe chill lasting one half hour pulse 130 respiration 22. This was just a temporary affair. Patient had no further trouble. On the sixty seventh postoperative day patient was up walking around and on the seventy fourth postoperative day patient was discharged feeling well.

CASE II

Male a physician seventy one years of age. Entered the hospital June 10 1927. This case is particularly interesting for the reason that on June 10 1914 exactly thirteen years ago to a day I removed the cecum ascending colon and first half of the transverse colon for an obstructing carcinoma of the ascending colon. Two years ago eleven years after this operation patient developed what appeared to be an acute intestinal obstruction with severe griping pain nausea and vomiting. Possibility of recurrence caused great alarm. With the application of hot packs over the abdomen the symptoms soon disappeared.

and the patient was well, and continued in active practice until the time of this operation

The following report of his case is taken from the records "About a month ago, patient began to note bloody stools, with a certain amount of mucus. A professional friend with whom he officed examined him and diagnosed carcinoma of the rectum. He then came to me and the diagnosis was confirmed.

'Date of operation—June 11, 1927. Abdomen is opened through the right rectus muscle near the median line. The liver is carefully examined, and no evidence of metastasis can be detected. Transverse mesocolon, and the anastomosis made thirteen years ago are examined carefully for a possible metastasis. No evidence of metastasis at any place—a very remarkable observation in view of the fact that the growth was so extensive when removed thirteen years ago. There are no enlarged glands in the mesosigmoid. The indurated area is relatively small, not more than one third of the circumference of the intestine. The rectal tube is passed into the sigmoid and passes easily by the growth which is located within easy reach of the anus. The patient is placed in the Trendelenburg position, all the intestines are packed back in the upper abdomen and held there by a five yard gauze pack. Full length of the sigmoid is drawn out into the wound. It is held up by an assistant making the lower segment of the mesosigmoid taut by pulling it as far up as possible. Long handled scissors bent at an angle to the borders of the blade and having a probe point on the under blade are used. The probe point of the under blade is now inserted through the peritoneum of the right leaf of mesosigmoid. This probe point is made to pass beneath the peritoneum external to the vessels. Scissors easily pass downward. Retraction holds the bladder well forward, and exposes the vesicorectal fold. This probe pointed scissor blade (Fig 519) passes across beneath the peritoneum of this fold to the left side. We next turn to the left side and cut the peritoneum along the mesosigmoid down to the cut coming from the right side. Finger is inserted through the mesentery and with the thumb and index finger superior hemorrhoidal artery is located and ligated with a strong dou

bled No 2 chromic catgut ligature in two places about $\frac{1}{4}$ inch apart. This superior hemorrhoidal artery is now cut between these two ligatures. Communicating sigmoid arteries below this point are clamped and cut without ligation. The gloved hand is now passed down the hollow of the sacrum along its front surface and all the fat and mesosigmoid lifted forward down as far as the tip of the coccyx. Next the bladder is separated from the rectum leaving all the fat with the rectum. There is no bleeding except from the return veins in the low mesenteric fat. These are clamped to prevent soiling the field. A large sponge is now placed in the hollow of the sacrum to keep it clean while the operation proceeds. A longitudinal wound is made in the left rectus muscle about $1\frac{1}{2}$ inches long so that the colostomy opening will be about $1\frac{1}{2}$ inches below the umbilicus. A large Payr's clamp is thrust through this opening and made to grasp the sigmoid proximal to the proposed point of section. Another Payr's clamp through the main operative wound is made to clasp the sigmoid distal to the point of section. Intestine is now cut with cautery and the clamp heated so as to sterilize the ends held in the clamp. The clamp holding the proximal end of the sigmoid is now brought out through the small incision in the left rectus for a permanent colostomy and the two deep layers of the abdominal wall are sutured to the intestinal wall with a continuous lock stitch of No 00 chromic catgut doubled. The skin is sewed to the intestine with fine interrupted sutures. The large Payr's clamp is now removed and small artery forceps takes its place. Purse string is placed around the distal end of the sigmoid. This inverted end of the sigmoid is then attached with a strong linen suture to the end of the rectal tube. Nurse now pulls on the rectal tube and draws it out through the anus. A large roll of gauze wicks fully as large as a man's wrist is placed in position the ends of the wicks being placed in the hollow of the sacrum. Two sheets of four thicknesses of rubber tissue are made to surround this roll of gauze as it comes up through the wound. With a continuous suture the space to the left of the colon is closed so that no intestine can work around it. This suture is now continued downward bringing in the

peritoneum of the lateral wall of the pelvis, closing off the space from which the colon has been removed, and separating it from the free peritoneal cavity. There is ample loose peritoneum in the narrow pelvis of man to surround this drain easily so that the suture continues. Gradually it brings in the peritoneum and comes forward to the edge of the main abdominal incision. This large cigarette drain, or protected gauze pack, is now entirely outside of the functioning peritoneal cavity. A flap composed of gauze and rubber tissue is now fixed and covered with collodion so as to separate the large wound from the colostomy."

On June 20, 1927, the second operation was performed, and is recorded as follows: "The coccyx is first removed. Fingers immediately enter the cavity of the drain placed nine days ago. A certain amount of pus comes out. The upper end of the inverted rectum is intact. After cutting the skin and muscles around the anus, the line of cleavage is found with the fingertips, and the rectum is pulled out through the wound. There is practically no bleeding at all except in the anal muscles. Capsule of the prostate gland is disclosed and is entirely smooth, which condition is found only when the superior hemorrhoidal has been ligated, and when a proper drain has been used. Why the line of cleavage is formed in this way, after this type of operation, I have never been able fully to explain, and yet it is true. The entire second stage of the operation, as performed in this way, is practically always done in five minutes or less. Many times not a single vessel is clamped, usually a few vessels in the anal region. A gauze pack is placed in the wound for two or three days. The skin is drawn over it with temporary sutures. This large gauze pack rapidly takes up the septic material from the new wound. The next day it is well to take out the upper drain. Three days after the gauze pack is placed it should be removed. From this time on, the wound is irrigated by inserting a tube through the abdominal end of the drainage tract."

Microscopic sections of the rectum and anus revealed an adenocarcinoma invading the wall of the bowel.

This patient did very well. Twenty-one days after this last

operation patient was up in a wheel chair. On the twenty third postoperative day while sitting in the wheel chair asleep, he suddenly arose the wheel chair receded and he fell on the floor. A very severe chill then a temperature of 105 followed within two hours. From this he recovered and left the hospital July 25, 1927 just one month and two days after the last operation. He was back in his office about six weeks later and is now apparently in good health although the sacral wound has not entirely healed.

The operation performed on this patient is the typical operation which was described and amply illustrated in *Surgery Gynecology and Obstetrics* June 1924.

CASE III

Female aged forty six County Superintendent of Schools. In 1917 patient had a hemorrhoid operation. In 1925 her appendix was removed. At that time and at periods from that time to the present she has been passing blood and mucus in the stools. Six months ago she noticed she was losing more blood than usual. Had no pain. During the past month she has developed a diarrhea in which large quantities of pus pass as well as blood. Prior to that time for some weeks she had had obstinate constipation. During the past month she has had very frequent loose stools no great amount of distention.

Entered hospital on June 9, 1927. Patient is very pale hemoglobin 35 per cent. An enema plate carefully watched shows no evidence of intestinal obstruction. Proctoscopic examination revealed a large amount of pus high up in the rectum with what appeared to be an ulcerative condition. It was not thought best to force the proctoscope higher so that the real growth was not encountered. Taking into consideration the history is of two years standing and the fact that the x ray failed to show a filling defect brings us to the probable diagnosis of Ulcerative Colitis.

Date of Operation—June 21, 1927. The patient has been under observation now for eleven days. During this time two blood transfusions 500 c c each were administered and the

hemoglobin has come up to 60 per cent, red cells have come up from 1,300,000 to 3,460,000, the white from 6000 to 13,000

"An incision is made just to the right of the median line with the idea of making a thorough exploration of the colon. Immediately upon opening the abdomen, a large mass is found low down in the abdomen. The mass is nodular, and is larger than a man's fist. Coming into the mass from above is the proximal sigmoid. Below the mass is the distal sigmoid. Attached to the upper surface of the mass is a loop of ileum. The small bowel seems to be intimately merged with the mass. Pressure with the finger discovers a hole through the mass from the small intestine side. In the mesentery of the loop of ileum is a gland as large as an almond, very hard. I remove this gland for frozen section examination. It is submitted to Dr Foskett. It is very evident that, regardless of the nature of this growth, it will be unwise to attempt to separate this loop of small bowel from the mass. Therefore we will place two clamps above and two below the mass. With the purse string, we invert the ends of the stumps of small bowel that are to be left attached to the mass, each of these stumps being about 4 inches long. There are a number of mesenteric glands noticed farther up along the mesentery of the small bowel. It is impossible to remove them. Therefore while we are waiting for the pathologist's report, we make an end to end anastomosis between the proximal and distal segments of the ileum. As we are finishing the anastomosis, the pathologist returns with the report that the mesenteric gland removed from the mesentery of the ileum and submitted to him for examination, is found to be carcinoma. Therefore, we know the final outcome of this case, but having begun on the operation, we must do the best we can to make the patient as comfortable as possible during her remaining days. So we will remove the growth as rapidly as possible. We find, in the mesentery of the lower sigmoid hard glands. It will be useless to remove the rectum. We, therefore, mobilize this portion of the sigmoid tie off its mesentery, also tie off the mesentery of the segment of ileum which has been cut out of the circuit, and which must go with the growth. These vessels are tied. The

distal end of the sigmoid is turned in by a purse string and dropped back in place. The proximal end, on which is a clamp, is brought out through the center of the abdominal incision, and the abdominal wound closed around it without drainage. This clamp will be allowed to remain until the patient becomes uncomfortable, possibly forty eight hours. The wound above and below the intestine will then be sealed with a collodion dressing, and the intestine opened."

This patient made an uninterrupted recovery, went home on July 28, 1927, thirty seven days after operation feeling well, and with great hope for the future. Her appetite was good, bowels moving regularly, and blood rapidly coming back to normal. It may be predicted that the patient will live several months of comfortable life, even performing her duties as County Superintendent of Schools. She was not told of the hopelessness of her condition, but her brother was told.

This is a remarkably interesting case for three reasons. First, an x ray enema plate failed to show this growth in the sigmoid, although there was almost total obstruction. The reason was that the mass of this growth had become adherent to the parietal peritoneum in such a position that the proximal sigmoid came into the growth from the front of the abdominal cavity. The lumen through the growth passed directly backward and entered the distal sigmoid, which was fixed to the posterior parietal peritoneum, so that constriction was covered by the proximal sigmoid. The second unusual feature is that the loop of ileum had merged into a cancer mass of the sigmoid, a contact growth had developed, and an opening, $\frac{3}{4}$ inch in diameter, was formed between the ileum and the sigmoid in the cancer mass. The diarrhea was, therefore, due in a large measure to the passage of ileal contents directly into the lower rectum. The third feature is the development of large metastatic glands from this contact cancer in the mesentery of the ileum.

CASE IV

Female, aged fifty six. The past year she has been traveling abroad with her family. About six months ago began to notice

a small amount of blood passing in the stools. No pain or distress. About June 20th patient was referred to an eminent proctologist in San Francisco by her physician. The proctologist made a diagnosis of carcinoma of the rectum, and recommended radical operation. For this she was referred to me on July 25th. At this time she weighed 100 pounds in street clothes. Blood Hemoglobin, 65 per cent, red cells, 3,600,000, white, 11,800. Patient presented the appearance of being very frail. On July 27th, blood transfusion of 600 c.c. of whole blood was administered. On July 30th, the first operation was performed, and was recorded at the time of operation as follows:

"A long, right rectus incision. Careful examination of the liver reveals no evidence of metastasis. There are no enlarged glands along the aorta or iliac vessels. There is an extensive growth involving two thirds of the circumference of the ampulla of the rectum, anterior wall. There are enlarged metastatic glands in front of the sacrum on the right side. The rectal tube passes by the growth and its end lies well up in the sigmoid. Colon is mobilized in the usual way as described in the 'Annals of Surgery,' 1915 and 1922, and also in 'Surgery, Gynecology, and Obstetrics' June, 1924. According to this technic, the rectum is separated from the sacrum and coccyx, and also from the vagina. Several glands are removed from the hollow of the sacrum on the right side, two of which are frozen and examined microscopically by Dr. Foskett, and found to be malignant. The colostomy is completed, the distal end drawn out through the anus by inversion. There is considerable bleeding in the left broad ligament, which requires time to control, and finally a large pack of gauze wicks is placed in the pelvis, both for drainage and control of broad ligament bleeding. This is surrounded with rubber tissue. The space to the left of the colon within the abdomen is closed off by continuous chromic catgut sutures. This is continued downward to draw in the parietal peritoneum gradually, using the various elements of the broad ligaments, and including the covering of the round ligaments. In this way complete peritoneal tube is made around the large drain. The uterus is in front of the drain."

Immediately after the operation, another blood transfusion of 350 c c of whole blood was administered

The patient was not more than ordinarily shocked by the operation. The chart shows she had a great deal of perspiration. Immediately after the operation the urine began to show a certain amount of albumin but it may be noted that from the beginning it was necessary to use the catheter. Progress of the case was quite normal and on August 8 1927 the second stage of the operation was performed through a sacral incision after having removed the coccyx. The operation was very short, requiring only four or five minutes. Wound was packed and no shock followed the operation.

Up to this stage the progress of the case is about normal except that the chart reports rather profuse serous drainage. On August 15th the drainage was reported as having the odor of urine but upon examination it could not be determined whether the urine had been passed out through the urethra or came through the sacral wound. There did not seem to be a sufficient amount to justify a suspicion that there was an injury to either the ureter or to the bladder. There was no further report on this subject at this time.

On August 24th a 50 mg tube of radium well screened was placed in the wound for twenty four hours. On August 31st another dose of radium was applied.

There seemed to be an increasing drainage from the sacral wound until September 10th when it seemed that a very large proportion of the output of one kidney must be coming from the wound, notwithstanding the fact that on September 10th, 37 ounces of urine were taken with the catheter, and on September 11th, 36 ounces of urine were taken with the catheter in twenty four hours, 16 ounces at one time. On September 13th, my attention was called to the large amount of water drainage, which the nurse thought had some odor of urine. The patient being very feeble and having required three transfusions was somewhat tardy in getting up, but was able to sit up in a wheel chair in the sun parlor on the 15th of September, thirty six days

after the first operation, twenty-six days after the second operation. By September 16th, she was able to walk around her room and around the hospital. On this day she took a walk on the veranda of the hospital. She was feeling much stronger than at any previous time, and was preparing to start for home in a few days.

After dinner, about 6 o'clock in the evening of the 16th, she felt slightly nauseated, and at 7 o'clock a sudden pain developed in the abdomen. At 7:30 there was great abdominal distress. She vomited part of her dinner, and became very restless. Cold perspiration over the brow. I was called immediately. Arrived at 9 p. m., and found the patient somewhat distended, bowels in tumultuous activity, although no gas was passing. After prolonged watching, peristaltic waves could plainly be seen. These waves gradually increased. At 10:30 patient was taken to the operating room and abdomen opened for intestinal obstruction which is recorded as follows: "The abdominal cavity is remarkably free from intra-abdominal adhesions. Yet, it is plain that parts of the small bowel are collapsed, while another part of the bowel is markedly distended. All the lymphatic vessels in the wall of this part of the distended intestine are filled with chyle as the result of the absorption of the recent meal. Finally, the cecum is identified, the collapsed ileum traced upward. About 10 inches above the ileocecal valve, a loop of ileum is found attached to the posterior parietal peritoneum. This attachment is partially separated with the fingers, and partially cut. The intestine above this point is still collapsed and empty. About 4 feet further, another loop is held down by an adhesion, the intestine still undistended. Four feet further up, a firm band holds a loop of intestine which has been somewhat tortioned. Above this band, bowel is distended, below it is empty. It is very interesting to note that, while there is no firm band constricting the intestine at this point, the lymph-vessels above this point are entirely filled with chyle, while there are no white lymph-vessels showing below this band. The band is cut and the intestine freed. The intestine is examined up to the upper end of the jejunum. The

contents of the small intestine are then pushed down into the empty small intestine and the abdomen closed

After the patient returned to bed the distress was relieved and no shock followed. Prompt action probably saved the patient's life.

As this paper is written the patient is in good condition and bids fair to make a complete recovery. There is without doubt a urinary leak coming from the wound. It seems evident however that most of the urine is delivered through the bladder which is intact. Patient will be allowed to get up and around with the hope that as the wound heals what appears to be a small hole in the ureter may gradually close or may gradually destroy the kidney which can be attended to later. If the urinary fistula continues however after the wound is entirely healed the ureter will probably be transplanted into the fundus of the bladder by the submucous technic.

This case has been a very dramatic one in its progress for the following reasons:

- 1 The patient was a frail woman who had lost considerable blood and had a low hemoglobin and red cell count before the operation was performed.

- 2 The growth was advanced beyond the fascia propria so that some of the glands were attached to the deep fascia in the hollow of the sacrum which required radium treatment as well as surgery.

- 3 There was an apparent injury to one of the ureters in the course of the first operation. This is one of the ever present dangers in cases of advanced carcinoma of the rectum although this has only occurred in my experience once since I began to use the present technic and that was the eighth case in the year 1916. The first accident occurred in attempting to remove glands well up in the sacrum at the second operation.

- 4 *Postoperative intestinal obstruction which may follow any abdominal operation.* This has occurred but twice before in more than 100 cases of cancer of the rectum operated upon by this method.

CASE V

Male, seventy three years of age, retired merchant Has always had good health until October, 1926 At that time he began to have broken stools On December 9, 1926, he had influenza Since that time has had frequent bowel movements, no pain no distress, no blood, until, during the past two months, stool has become watery and frequent, ten to twelve times a day Was never constipated in his life Has lost 33 pounds in the last ten months Physical examination shows blood pressure of 162/80 Kidney function diminished Faint traces of albumin, and occasional hyaline casts Patient presents the appearance of a very old man Upon examining the rectum, the finger detects a growth high up Apparently the obstruction is almost total Blood is normal, coagulation time is normal

Report of the operation on August 5, 1927, follows "Opened the abdomen through a right rectus incision near the midline There is no evidence of metastasis in the liver There is no evidence of metastasis in the retroperitoneal glands and the growth is removable, although it completely encircles the bowel about the junction of the lower sigmoid and rectum Mobilization completed according to the standard technic (as related in Case II of this series) After mobilization has been completed it is found that clamps can be applied nearly 2 inches below the growth The intestine is severed between the clamps with the cautery The proximal end of the sigmoid along with the growth is brought out through the wound The stump of the rectum is turned in with a purse string and further turned in with interrupted sutures, and dropped back into place Owing to the feeble condition of the patient, it is necessary to conserve all the time that is possible Therefore, after the growth is removed, the proximal sigmoid is brought out through the upper end of the main abdominal incision The peritoneum is closed over the pelvis We take the chance of infection in the pelvis in not having drainage, but it will be an easy matter to make a stab wound in the stump of the rectum, or to cut through the sphincter in case septic symptoms develop"

Progress of the case was quite normal except that a chronic bronchitis which had followed his attack of influenza in December 1926 was greatly aggravated by the anesthetic and a severe cough with extensive bronchorrhea followed. On August 8th temperature was 100 pulse 90 patient coughing a good deal but bowels moved well through the colostomy opening. On August 9th temperature rose to 101 pulse 88 cough distressing. The cough was very annoying and the amount of fluid expectorated was profuse and at times slightly tinged with blood although no signs of pneumonia could be detected. On August 17th twelve days after the first operation patient became more restless. Temperature took a sudden rise. On inserting the finger into the rectum it was found that the end of the stub of rectum had opened a large amount of pus draining out through a tube inserted into the rectum. Patient was then taken to the operating room local anesthesia administered around the anus and with cautery the small stub of the rectum was cut backward through the anus to the coccyx which gave free drainage to the cavity in the hollow of the sacrum. This was done without pain and without shock to the patient. Cough continued temperature went down to normal pulse to normal. On August 26th twenty one days after the first operation patient was up in the chair and on the twenty ninth was walking a few steps. His exercise was gradually increased. On September 7th thirty three days after the first operation his temperature went to 101.8 F° pulse rose to 120. From this he rallied and again on the 12th of September thirty eight days after the operation pulse 88 and temperature 98° F and patient seemed to be in good condition. On September 13th thirty nine days after operation patient suddenly became cyanotic and died within a few minutes.

CASE VI

Male aged fifty nine occupation baker born in Germany. Admitted to the Portland Surgical Hospital August 4 1927. Has always been more or less constipated since childhood. Six months ago began having lumpy stools mixed with a watery substance which would come away with a gush. He took

some medicine which seemed to give relief. For the past four or five months has been having diarrhea 10 to 15 stools a day. Recently has noticed some blood considerable gas in the bowel. About four months ago patient noticed a lump in his left side but decided it was gas inasmuch as hot applications over the abdomen caused it to disappear. Physical examination showed blood pressure of 128/80. Patient seemed to be very sick. His blood showed 85 per cent hemoglobin with coagulation time of six minutes. Blood urea about normal for one of his age. Urine showed trace of albumin and a few hyalin casts. Digital examination revealed a large nodular mass almost surrounding the upper portion of the ampulla of the rectum.

Record of the operation on August 5, 1921, is as follows:

Long right rectus incision. Careful examination of the liver shows no evidence of metastasis; no enlarged retroperitoneal glands are noted although the growth is very extensive. Nevertheless the nurse is able to pass a rectal tube through the center of the growth. The sigmoid is distended with soft fecal matter which will not go through the rectal tube. This is a very unfavorable condition of the bowel for such a big operation. Yet the patient has had a very large dose of castor oil and this is the best result we could get so we will make the best of the circumstances. Sigmoid is mobilized in the usual manner. The growth is mobilized down to the tip of the coccyx from behind. There are large hard glands in the mesosigmoid—evidently cancer. The fat in the hollow of the sacrum along with the lymphatic glands is trimmed away. Owing to the fact that the sigmoid is full of fecal matter no attempt will be made to perform the colostomy in the usual way through a separate left rectus incision. The sigmoid is doubly clamped with Payr's clamp about 6 inches above the growth. All the fat along the mesenteric side of the distal segment is trimmed away and inverted with a purse string and attached to the tube to be drawn out through the anus. The opening in the growth proves too small to admit the inverted sigmoid. Therefore a few interrupted sutures close the intussuscepted end as shown in Fig. 522. A very large gauze pack composed of 24 wicks making a pack

of gauze as large as a man's wrist, is carefully placed in the hollow of the sacrum. Rubber tissue is placed around it and the parietal peritoneum is drawn around the gauze pack, so as to leave it within a separate peritoneal tube. Proximal end of the sigmoid is brought out through the main incision. About 6 inches of the intestine is outside the abdomen, and will be used to carry the fecal contents over like a spout. It will be opened in twenty four or forty-eight hours, depending on the condition of the patient. The remainder of the wound is covered with a collodion dressing."

Microscopic sections of the piece of intestine reveal a carcinomatous hyperplasia of epithelium, with marked inflammatory reaction.

Progress of the case was normal, and one week after the first operation, August 13, 1927, the second operation was performed. On making the incision for mobilizing the coccyx the drainage cavity was opened, and the operation seemed so simple and the drainage so perfect that it was thought well to leave the coccyx which had a rather unusually sharp curve. This patient made an uninterrupted recovery, but on observation of the anal wound it appeared that the cavity inside the coccyx was too large for the external opening. Therefore the coccyx was removed on September 8th, twenty six days after the second operation, so as to permit of more drainage. On September 14th the excessive intestine, which protruded through the bowel wound, was removed by first coagulating the intestine and mesentery with Wyeth's endotherm needles and then cutting away the redundant intestine with the cautery knife.

CASE VII

Patient is a male, aged seventy three, married, postmaster in a small town. In 1919 had his prostate gland removed. About four months ago began expelling mucus, and thin watery stools. Recently there has been a slight amount of blood, occasionally. There is a feeling of pressure in the rectum. The patient presents the appearance of being a relatively healthy patient for his age. His blood pressure is 150/100. Kidney function is

about normal for one of his age. Faint trace of albumin in the urine, but no casts. Digital examination reveals a hard, nodular growth about 5 inches from the anus. Report of the operation is recorded as follows: "Long, right rectus incision near the median line. Examination of the liver and retroperitoneal area reveals no evidence of metastasis. The growth is at the recto-sigmoid junction, and entirely surrounds the rectum with a small hole in the middle. The sigmoid is mobilized in the usual manner down to the tip of the coccyx, and is also separated from the bladder. The absence of the prostate is noted. After the intestine and fat have been freely separated from the sacrum and coccyx, and from the bladder, traction on the sigmoid brings the growth well up into the wound. Two heavy clamps are placed on the rectum about 2 inches below the growth. The intestine is severed between these clamps. The distal clamp is left on the rectum. All rectal and sacral fat is removed in a mass, along with the glands. Owing to the great age of the patient, the proximal colon is brought through the main incision about $1\frac{1}{2}$ inches below the umbilicus. Twenty-four single wicks, in a mass about the size of a man's wrist, are placed in the pelvis as a drain. They are so packed in that the hollow of the sacrum is quite well filled. Rubber tissue, four thicknesses in each sheet, is placed around the drain. Pelvic peritoneum is then drawn around the drain, so as to leave the drain as an isolated peritoneal tube."

Patient made an uneventful recovery from the first operation, which was performed on September 6th. On September 14, 1927, eight days after the first operation, and after removal of the coccyx, the remnant of the rectum, anus and anal muscles were removed, the second operation requiring less than five minutes. It was not necessary to tie a single vessel. No shock followed, and the patient is making an uninterrupted recovery.

RÉSUMÉ

This review of seven consecutive cases occurring in four months' practice, shows how impossible it is to cover a subject completely by any formal description. For in this group of cases

we have a number of features which would not be covered in a formal description of the operation

In the first case we were dealing with a case of total obstruction with all the symptoms of acute intestinal obstruction which is not infrequent in carcinoma of the large intestine. In such cases it is necessary to conserve the patient by simplifying the operation as much as possible. In this case we first intended to do a Mikulicz operation. This was prevented by the attachment of the growth to the parietal peritoneum and by the extent of gland involvement in the mesosigmoid below the growth which required the separation of the sigmoid from the pelvic wall and from the ureter making it necessary to cover the raw surface with rubber tissue and apply a drain. Second owing to the extent of the operation and the serious condition of the patient it seemed advisable further to shorten the time by bringing the sigmoid out through the abdominal incision.

The important point in the second case was that the operator had personally removed an extensive cancer in the ascending colon thirteen years before and that there was no evidence of metastasis in any part of the body. Undoubtedly the cancer in the rectum was entirely independent of the first cancer located in the ascending colon.

In Case III the diarrhea was of an unusual character. A loop of ileum had attached to a very extensive growth of the sigmoid and a cancer had extended to this small intestine and to the mesenteric glands and had established a short circuiting of the small intestinal contents through a cancerous opening into the lower rectum. The case was too far advanced for the hope of permanent cure. Nevertheless the attached loop of small intestine with its mesentery was cut out of the circuit and the intestinal continuity established by an end to end anastomosis while the growth was removed the distal end of the sigmoid turned in and the proximal end was brought through the main incision for temporary relief of the patient.

Case IV was an advanced cancer in a frail woman. It seems that one ureter was injured in some way during the first operation. Normal recovery until the forty seventh postoperative

dry when suddenly an acute intestinal obstruction developed due to a small fibrous band which was relieved by another operation

Case V The patient being a very feeble old man an attempt was made to avoid drainage and to avoid removal of the stub of rectum which was apparently not involved This has been attempted on two other occasions In both instances the stump of the rectum later had to be removed The stub of the rectum closes and leaves a pus cavity in the hollow of the sacrum so that in every instance it has been necessary finally to remove the rectal stump and the coccyx

Case VI represents an extensive growth encircling the upper rectum, in which it was impossible to make a complete inversion of the sigmoid but in which the growth was too low down to remove at the first operation Therefore the stump was partially inverted In this case an attempt was made to preserve the coccyx This was found to be a mistake and the coccyx was removed later

The last case illustrates how an old man in good health otherwise may be made to pass through the operation with relatively little shock providing plenty of drainage is used

In closing this discussion of the radical operation for cancer of the rectum the one important feature of the original operation which I would emphasize more than any other is the use of a large amount of gauze wicks as a drain During my experience, I have attempted to cut down the amount of drainage and two of the deaths I have to report I believe to be due entirely to an attempt to make a small drain suffice I now use twice as many gauze wicks as I did when my formal descriptions were made

5

CLINIC OF DR FRANK HINMAN

UNIVERSITY OF CALIFORNIA HOSPITAL

THE SIGNIFICANCE OF PAIN IN THE DIFFERENTIAL DIAGNOSIS OF KIDNEY AND URETERAL CONDITIONS FROM INTRA-ABDOMINAL

WHEN it brings the patient in for an examination that leads to a correct diagnosis and cure, pain is a blessing in disguise. But misfortune frequently arises, because pain is not always present or fails to recur after the initial attack, and it is in no case pathognomonic. Mistakes in diagnosis occur whenever too much reliance is placed upon it, clinically.

Certain abnormalities of any organ below the diaphragm may cause a similar pain, and it is not possible to diagnose accurately a single pathologic condition of any abdominal organ from pain alone. This is due to the fact that the pain, caused by disease or abnormality of any viscera, is propagated, as a rule, to an area other than that in which it is produced. The parenchyma of an organ is devoid of pain sensations, but the capsules or coverings, the ducts, and the blood vessels can give rise to pain. Sudden changes, such as stretching, pulling, distention, etc., are the common factors in back of visceral pain. The sympathetic and non sympathetic systems commonly innervate the viscera (Fig 523). They do not carry nerves of pain sensation. But the stimulus from the seat of irritation or impulse in the organ is carried back to the particular cord segment, to which these fibers or their ganglia belong (Fig 524). Sensory nerve centers of this area in the cord receive the impulse, and transmit it to the brain as coming from the area of termination of the cerebrospinal nerves of that segment (Fig 525). The cutaneous centers in that segment also are stimulated by impulses coming

into it, and their terminations on the body surface react more to stimulation than normally which is the basis of the hyperalgesic zones of Head each cord segment having its own well

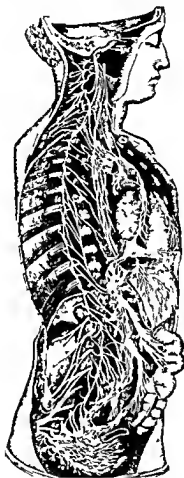


Fig. 523 — Shows diagrammatically the complicated sympathetic system in nervating the viscera (after Quain)

defined superficial skin area innervated by the cerebrospinal nerve of that segment (Fig. 526). As a matter of fact however Head's zones are of very little practical value in diagnosis. But a knowledge of the cord segments that serve as centers of visceral

innervation is important. Certain segments serve different and often widely separated viscera, so that the pain sensations from disease of these viscera may be similar, or have confusing resemblances. For example the kidney and upper ureter, the liver and bile ducts, spleen, pancreas, adrenal, testicle, ovary, uterus, Fallopian tubes, diaphragm, urethra, intestines, and appendix have nerve terminations in the ninth, tenth, eleventh and twelfth dorsal or first lumbar segments (Fig. 527). And pain from disease of any one of these organs may simulate pain usually regarded as typical of any of the others.

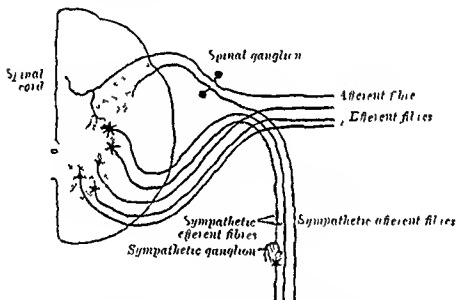


Fig. 524.—Illustrates diagrammatically the relationship of the afferent and efferent sympathetic fibers to the sensory nervous and spinal cord segments (after Quain).

There are two main types of pain due to abnormality of the abdominal viscera: the one is localized to the region of the organ only possible when it is supplied with cerebrospinal nerves, the other by a transference of stimulation in the cord is referred to the distant area innervated by the spinal nerves of that cord segment. Many localized pains are complicated or made easier of interpretation by more or less characteristic modes of radiation which are often typical cord propagations. The pain in the testicle or down the ureter in renal colic is a type of radiating

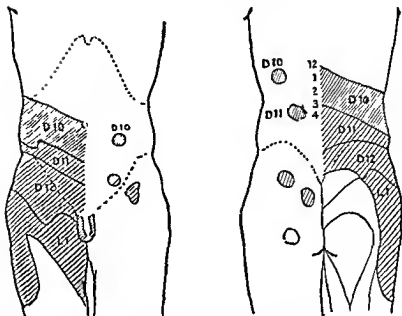


Fig 526—The hyperalgesic zones of Head in diseases of the kidney. The sensory nerve centers in the twelfth dorsal, first, second, third, and fourth lumbar may be stimulated to a hypersensitive condition by impulses coming in from the sensory fibers ending in these segments (after Behan)

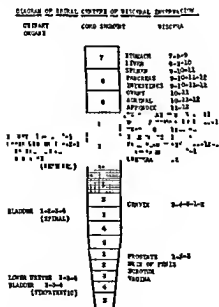


Fig 527—Represents diagrammatically the sympathetic nerve endings of the various viscera in the spinal cord segments, showing the predominance of the tenth, eleventh, twelfth dorsal, and first lumbar.

in the cord segments that are frequently encountered in pain due to disease of any of the viscera (Fig 528)

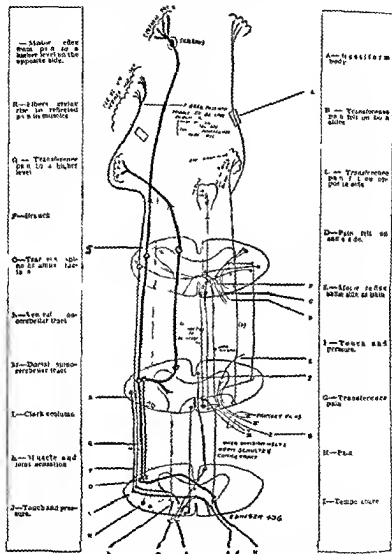


Fig 528 — Illustrates the different types of propagated pain (after Behan)

While pain as an isolated symptom is unreliable in diagnosis, in association with other findings it is extremely valuable. Mus-

cle spasm and local tenderness, or the ability to reproduce the pain by certain manipulations, are frequently of great significance in an examination into the cause of pain. It is often that negative findings in this respect are as valuable as positive ones. The importance of McBurney's point of local tenderness in appendicitis, tenderness under the costal margin in gall bladder disease, or of Murphy's or Thompson's method of demonstrating renal tenderness in disease of the kidney, are examples. But because of the many types of pain propagation, and the patient's uncertainty and unreliability in interpreting his own pain sensations reproduction of pain is often misleading. Also, a sensitive ureter may simulate appendiceal tenderness, or vice versa, and there may be tenderness under the costal margin in renal disease. Other clinical findings are helpful. The absence or presence of changes in the temperature, in the blood, urine, and feces have significance in determining the cause of backache or abdominal pain. The really difficult case is the one in which all these associated findings are negative, a not infrequent occurrence.

The pains requiring differentiation in suspected disease of the kidney or ureter may be best considered in two groups I, the backaches and II, the stomachaches. The first consideration when there are no outstanding associated findings, is to rule out any probable local back-pain. Backache of local origin may be due to Rheumatic affections, myalgias, architides, sacro iliac or sacrovertebral slips, strains, postural defects, vertebral lesions, caries, or fracture.

Backache of referred origin may be grouped according to the different regions of the back, as follows

1 *Pain Referred to Dorsolumbar Region*

(a) *In middle of back or more to right or left*

Intercostal neuralgia
Diaphragmatic lesions
Perihepatitis
Adrenal
Abdominal tortitis

(b) *More to right*

Renal and ureteral lesions
Diseases of liver or gall bladder
Adrenal

in the cord segments that are frequently encountered in pain due to disease of any of the viscera (Fig 528)

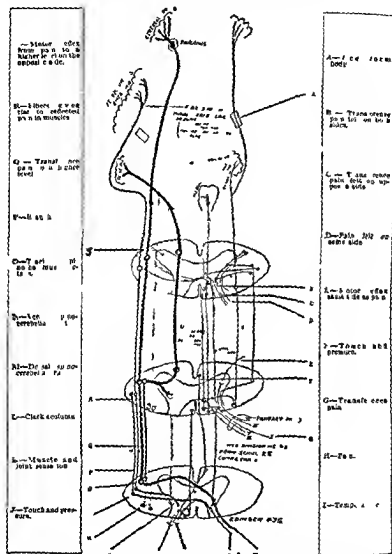


Fig 528 —Illustrates the different types of propagated pain (after Behan)

While pain as an isolated symptom is unreliable in diagnosis in association with other findings it is extremely valuable. Mus-

- II *Pain Referred to Region About Umbilicus, or to Midabdomen in General*
 (Rare in urology)
 Meteorism and Tympany
 Volvulus
 Intestinal obstruction or strangulation
 Appendicitis
 Ileocolitis
 Embolism of the superior mesenteric
 Enteroptosis
 Peritoneum
 Intra abdominal rupture of intestine renal or perirenal abscess
 Bladder
 Pneumonia
 Tabes
- III *Pain Referred to Midabdomen or Suprapubic Region*
 Bladder
 Seminal vesicles
 Colon
 Rectum
 Organs of generation
 Embolus of inferior mesenteric
- IV *Pain Referred More to Right Side*
 Renal and ureteral
 Appendix
 Liver and gall bladder
- V *Pain Referred More to Left Side*
 Renal and ureteral
 Stomach
 Spleen
 Pancreas
 Pericardium
- VI *Pain Referred Either to Right or Left*
 Intercostal neuralgia
 Tabes
 Diaphragmatic traction
 Intestinal adhesions
 Pelvic adhesions
 Ovaries and tubes
 Vesicles and prostate
 Groin and inguinal parts of epididymis testicle, or hernia

The characteristics of renal and ureteral pain may be stated briefly. Renal pain is of two types, capsular and pelvic. But with all pelvic pain there is probably an associated capsular disturbance, for pelvic distention gives capsular stretching. Ab

normality of or about the capsule may cause pain unassociated with any disturbance of the renal pelvis or ureter. Clinically the dull lumbar ache is recognized as more characteristic of capsular the sharp renal colic of pelvic or ureteral disturbance. It is often impossible to differentiate pain of pelvic and upper ureteral origin. In fact any ureteral obstruction has its effect both on the pelvis and renal capsule. In testicular pain of upper ureteral origin the tunica vaginalis alone may be hyper sensitive but when the cause is in the lower ureter the skin of the scrotum may also be tender (see Fig 527).

The Incidence of Renal and Ureteral Pain—Almost any abnormality of the urinary tract may cause pain in the kidney either directly or indirectly. Obstruction pain infection is a characteristic syndrome of most urinary lesions. Urinary obstruction commonly occurs in some form and at some time in most urogenital diseases and whenever there is obstruction pain and infection are prone to follow. Back pressure stasis and back flow are the factors causing disturbance and many and various are the conditions that may make these factors effective. Urologists recognize two groups the infra and supravescical which differ considerably in their clinical manifestations but always require joint consideration because of the importance of their relationship with respect to priority of occurrence. Marked supravescical changes often are due altogether to lower tract abnormalities the neglect of which would tend to serious errors of diagnosis and treatment. The more frequent lower tract abnormalities that may give rise to obstruction pain or infection of the upper tract may be classified briefly as follows

I Lower tract Abnormalities of Congenital Origin

Long tight foreskin

Congenital atresia or stricture of the urethral meatus

Urethrocele or diverticulum

Abnormal openings and fistulae (hypospadias epispadias exstrophy hermaphroditism)

Posterior urethral valves in boys

Contracture of neck

II Acquired Conditions of the Lower Tract

Nervous reflex

Urethral stricture stone, or polyp

Prostatoseminal vesiculitis
 Vesical stone, tumor, or diverticulum
 Spinal cord or cerebral lesion
 Prostatism
 Hyperplasia
 Cancer
 Contracture of the vesical neck

The abnormalities of the upper tract, that give rise to obstruction, pain, or infection, are of much more importance from the standpoint of diagnosis and differential diagnosis is sometimes very difficult. Primary and secondary conditions may be active in the same case—the one congenital, the other acquired. They may be classified as follows:

I *Congenital Upper tract Abnormalities*

(a) Ureteral

Anomalies of form and caliber
 Congenital valves or folds
 Congenital strictures of meatus
 Uretrovesical cysts
 Total relaxation or dilatation (megalo ureter)
 Anomalies of division
 Double
 Triple
 Complete or incomplete diverticulum
 Anomalies of termination
 Into bladder neck or blind openings into bladder wall
 Into urethra
 Male Into seminal vesicles ejaculatory duct vas etc
 Female Into vagina vulva uterus etc
 Into intestine

(b) Pelvic and Renal

Anomalies of form
 Anomalies of number
 Anomalies of size
 Anomalies of position
 Anomalies of vascularization

II *Acquired Conditions of the Upper Tract Causing Urinary Obstruction, Reflux, or Stasis*

(a) Ureteral

Stone
 Stricture and stenosis (1 focal [Hunner] or 2, local [as in pelvic inflammatory, vesiculitis])
 Valves or folds (in tortuous hydro ureter)
 Kinks or angulations (from bands blood vessels, adhesions)

II *Acquired Conditions of the Upper Tract, etc* (continued)

Pressure from outside (pregnancy pelvic tumors etc)

Trauma

Uretropelvic conditions with ptosis (valve, kind fold, stricture)

Ureterovesical conditions (stricture of intramural inflammation)

(b) Pelvic

Stone

Tumor

Parasites

(c) Renal

Stone

Tumor

Ptosis with kink or angulation (from aberrant bands adhesions or blood vessels)

Discussion—For purposes of differential diagnosis of pain, abnormalities of the upper tract, as above listed are of particular importance. Complete routine urologic study is required for differential diagnosis and it is not infrequent that even these findings prove to be indefinite. The methods of differentiation in ureteral stricture are quite various and most unsatisfactory, and most urologists at the present time make a diagnosis of stricture mostly on the evidence of the ureterogram, which should show dilatation of the ureter above the point of constriction. The differentiation of stricture from kinks and angulations, due to adhesions or bands fixing the ureter, and thus with or without association with ptosis, is often confusing. In addition to these definite obstructive causes of pain, which are the more common, there is a more uncertain group due to abnormalities or conditions of the capsule and perirenal tissue, or to abnormalities of the urine secreted. Edwin Beer has emphasized the significance of uric acid showers in the etiology of renal colic, and believes that, in many cases in which diagnosis of stricture of the ureter has been made, the cause of these painful attacks is not stricture, but showers of uric acid crystals. To quote a recent article ("Uric Acid and Uratic Stones in the Kidney—Uric Acid Showers and Their Diagnosis," *Surgery, Gynecology, and Obstetrics*, 43, 442, 1926) "I believe that I am justified in saying that in patients in whom the x ray, cystoscopic, and

pyelographic studies have been negative, and who complain of typical ureter or kidney colics, if their urine is allowed to stand and precipitates uric acid crystals, there is some connection between this phenomenon and the syndrome of which the patient complains."

Another important fact to be kept in mind in the differentiation of the cause of renal pain is that many ureteral stones fail to cast a shadow in the ordinary x-ray pictures, and waxed-hulh exploration should be used as a routine in all such cases, because by it alone can a positive diagnosis be made.

Summary.—From the above brief outline it is apparent that pain can in no case be considered pathognomonic. It is of value because it brings the patient in for examination, and is an indication for more complete study. Pain from disease of almost any intra-abdominal organ may simulate pain ordinarily regarded as typical of any of the others. Associated findings are of most importance, such as changes in the body temperature, in the blood, urine, and feces. The real difficulty in differentiation often arises in case all these associated findings are negative. The differentiation of pain, possibly due to some abnormality of the urinary tract, requires a most careful and complete urologic investigation, and the differentiation of upper-tract causes, particularly—such as capsular and perirenal conditions, ptosis with kink or angulation, ureteral stricture, invisible ureteral stone, or uric-acid showers—requires most careful consideration.

CLINIC OF DR WAYLAND A MORRISON

SANTA FE HOSPITAL, LOS ANGELES, CALIFORNIA

DIAPHRAGMATIC HERNIA

It is only within the last few years with the general use of x rays, that preoperative diagnoses have been made of diaphragmatic lesions. The war brought many traumatic hernie of the diaphragm to the operating table and surgeons were impressed with the fact that, provided one side of the chest was in good condition, the other side could easily be opened without any great danger to the patient.

Up to 1912, 650 cases had been reported. Since then, a considerable amount of space in the literature has been devoted to reports of many different types. It is interesting to note that the first successfully operated case by the thoracic route was in 1889. In very few of the cases reported was diagnosis made before operation. Often the lesion was not found until autopsy.

True herniæ must be distinguished from marked eventration of the diaphragm. When the diaphragm is very thin and high, this differentiation may be quite difficult. However, injection of air or gas into the peritoneal cavity usually will bring out the line of the diaphragm in the x ray plate, and show the existing pathology.

There are two main types of diaphragmatic hernie—the congenital, and the acquired or traumatic. The congenital is again divided into two types—the hernia with a sac, and the one without. Traumatic herniæ, unless small, have no peritoneal covering, as a blow sufficient to break the diaphragm would also tear the peritoneal reflections covering the muscle. It has been found that only about 10 per cent of diaphragmatic herniæ have sacs.

The location of the herniæ in this region is interesting but easily explained anatomically. Over 90 per cent are on the left side. The thorax may contain almost any of the organs of the upper abdomen. In one of the cases here reported the entire liver was found to be above the diaphragm on the right side. It is remarkable how few symptoms an extensive lesion of the diaphragm may produce. As a rule patients do not come to the surgeon until the bowel has become obstructed or some other secondary lesion has become unbearable. For this reason herniæ of the diaphragm undoubtedly are much more frequent than is generally supposed. Patients may receive a rent in the diaphragm coincident with some other severe traumatic lesion, the obvious injury being treated and the hernia neglected. It is a regrettable fact that injury cases even in our best hospitals often receive only a hasty general physical examination.

The symptoms of diaphragmatic hernia are varied. They range from those of complete intestinal obstruction to an occasional gurgling in the chest. Some cases may have merely a slight dyspnea on exertion. The physical signs also are varied and range from absolute flatness when a large organ is in the chest to almost normal findings when a small coil of intestine is above the diaphragm. The greatest diagnostic aid is the x ray.

The treatment of lesions of the diaphragm is surgical. The exception to this is the case in which palliative measures may be instituted, operation being refused or considered inadvisable. Obstruction or strangulation of the organs involved is most to be feared. I have had no experience in the operative procedure in eventration of the diaphragm and do not believe many of these cases call for treatment.

There are two routes by which diaphragmatic herniæ may be successfully repaired. Either of these may be used alone or in difficult cases both may be used. The French have leaned toward the thoracic route while in this country many surgeons prefer the abdominal. The thoracic route I have found more desirable as the exposure from below is difficult and one has to work blindly in enlarging the opening in the diaphragm in order to reduce the misplaced organs. In the thoracic route it

is sometimes unnecessary to resect a rib as sufficient exposure may be obtained by a long incision between two ribs, combined with sufficiently strong retraction. However any amount of exposure may be secured by resecting one or more ribs. The lung on the affected side is usually more or less contracted due to the abdominal pressure through the rent in the diaphragm. There is, therefore, very little shock experienced on rapidly opening the chest wall.

The following cases have been selected to bring out interesting points in different types of lesions.

Case I is that of a young man of twenty six who entered the Santa Fe Hospital in January of last year with the following history. Six months before he had been seized with what he thought was "acute indigestion." He had severe epigastric



Fig. 529—Case I. Roentgenogram of the chest showing eventration of the diaphragm.

pain which lasted for one week. This was followed by cramps and a burning pain at the "pit of the stomach" which came on about an hour after eating. The pain could be relieved by taking bicarbonate of soda or a little food. The distress would sometimes become much less, but it always recurred and he had not

been free from symptoms since onset. Nausea recently had been present after each meal and he occasionally vomited a frothy sour material with some relief. During the previous year he had lost 20 pounds. His appetite was poor and he was very constipated. He had never had black stools.

His past history was good except for a severe secondary anemia in 1921. He went to a large eastern clinic where he was told that his condition was due to lead poisoning. At that



Fig. 530.—Case 1. Roentgenogram showing eventration of the diaphragm which was mistaken for hernia. The diaphragmatic line can be seen above the stomach which is turned on itself. Note penetrating ulcer on lesser curvature.

time he was given a gastrointestinal study and was told he had a diaphragmatic hernia which was inoperable. He also was given several blood transfusions and his anemia never returned.

At the time he came under our observation he was an emaciated young man whose general physical examination was essentially negative except for abnormal tympany over the region of the liver. The laboratory findings were unimportant except for increased acidity in stomach contents and 1+ albumin in the urine. Gastrointestinal study with barium showed the

stomach in the right thoracic cavity, and the condition again was mistaken for diaphragmatic hernia. He was put to bed and placed on small feedings, in hope of thus temporarily relieving his condition. Symptoms diminished and he left the hospital two weeks later.

Six months afterward he was readmitted with return of his old symptoms. He was again studied. This time 400 c c of air were introduced into the abdominal cavity before he was given the barium meal. About this time the patient developed an acute appendicitis, and was operated. Exploration during operation disclosed practically the same findings as shown in the accompanying roentgenogram. Even with the hand in the abdomen, it was difficult to make a differential diagnosis. The ulcer on the lesser curvature could not be excised owing to the position of the stomach. However, since being placed on an ulcer diet, the patient has gained weight, and is practically symptom free.

This case serves to show the difficulty which sometimes is experienced in making a differential diagnosis between an eventration of the diaphragm and a diaphragmatic hernia.

Case II is that of a lineman, aged forty-four. Shortly before admission, while working on a power line, his belt broke, and he fell 40 feet to the pavement. His right hip struck the ground first. He was unconscious for a while, but regained consciousness shortly after coming to the hospital. He complained bitterly of severe pain in the right hip and lower back.

His past history was negative except that once before he had fallen from a pole and fractured several ribs on the right side. Physical examination showed a well-developed man suffering from a comminuted fracture of the left radius, lower third; compression fracture of the second lumbar vertebra; fracture of the right acetabulum, involving ilium and ischium; fracture of the right femur at neck; lacerated wound above the right eye. The general physical examination, made by the interne, showed normal chest findings.

The patient gradually recovered, except for non-union of the

neck of the right femur. He was operated by an orthopedic surgeon one year after the accident. Three months later he developed a high temperature with a white cell count of 20,000. The right chest was found to be flat. Attempted aspiration only obtained bright blood. *x* Ray findings are shown in the accompanying roentgenogram.



Fig. 531.—Case II. Roentgenogram of chest showing liver in thoracic cavity.

A diagnosis of acute appendicitis was made and operation performed. The patient had generalized peritonitis. The appendix was gangrenous. He died a few days later. Autopsy disclosed the entire liver in the right thoracic cavity. This case is especially interesting owing to a lack of symptoms in spite of an almost complete tear of the right dome of the diaphragm.

Case III is that of a house wife of thirty nine who had had trouble with her heart for several years. She complained of shortness of breath when walking or lying down. Sometimes she had a choking sensation in her throat. Often her feet swelled and her face became puffy. Occasionally at night she had choking spells at which time her lungs filled up until she could not breathe and had to rise and walk about to get relief. She was troubled with constipation, and was forced continually to take cathartics. Past history was unimportant.

Examination disclosed a short, fat, Jewish woman, her head and neck normal, chest well developed, lungs negative. Her heart extended 11 cm to the right in the fourth interspace, and $3\frac{1}{2}$ to the left. The heart sounds were distant, but clear, the abdomen tympanitic throughout. Liver, spleen, and kidneys were not felt. There was a distinct tenderness in the right lower abdomen, but no masses or other tenderness were noted.



Fig. 532—Case III. Roentgenogram showing stomach in left chest. This case also has a dextrocardia.

x-Ray examination of the chest showed the heart to be on the right side, and moderately enlarged. There was a gas bubble in the left chest, at the level of the base of the heart. Gastrointestinal study showed the stomach to be in a vertical position in the thoracic cavity. There was a well formed cap pointing downward. At the end of three hours the stomach was empty. A six-hour plate showed the barium in the transverse colon. This case was studied twice, and it is interesting to note that in the first study the splenic flexure was above the diaphragm, while in the second it was below. The stomach was in the same position in both instances.

In view of the absence of any trauma, this case is apparently a hernia of the congenital type. Her symptoms undoubtedly are cardiac in origin. She also is a confirmed neurasthenic. Owing to these facts, and the technical difficulties which would be encountered in a woman of her build, operation was deemed inadvisable. The dextrocardia is interesting because of its rarity.

Case IV is that of a white adult of thirty nine, a bricklayer by occupation. While working on a building he fell two stories to the ground. On the way down he struck a beam, crushing the left side of his chest. He was immediately taken to the hospital.



Fig. 533 —Case IV. Roentgenogram showing splenic flexure of colon passing through diaphragm on left side.

Physical examination disclosed a well developed and well nourished man, lying quietly in bed but having difficulty in breathing. His respiration was 24 and irregular, his pulse 90 and of good quality, his temperature 97.8° F, blood pressure 140/75. Head and neck were normal. The chest showed fractures of the seventh, eighth, ninth, and tenth ribs on the left side. There was a 3 inch lacerated wound in the region of the fracture, with

a fragment of one rib visible The left chest was flat to percussion, and breath sounds were absent There was exquisite tenderness over the left kidney, but no bulging Abdominal

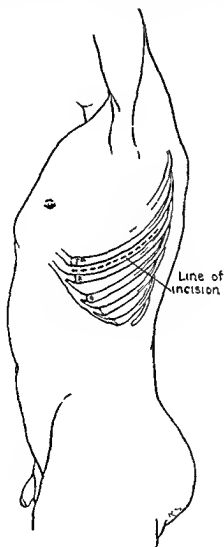


Fig 534

muscles were slightly rigid, but no shifting dulness was found, and no abnormal tenderness

Urinalysis showed a trace of albumin a trace of sugar, and a few blood cells microscopically The blood count was as follows Hemoglobin 85 per cent red blood cells 5,610,000,

leukocytes, 14,151; polymorphonuclears, 84 per cent. x-Ray examination disclosed an effusion of the left chest and the fractured ribs

The left side of the chest was immobilized with resultant relief of most of the symptoms. A few days later the chest was aspirated, and 200 c.c. of bloody fluid removed. This was repeated again in a few days, and by the end of six weeks the left

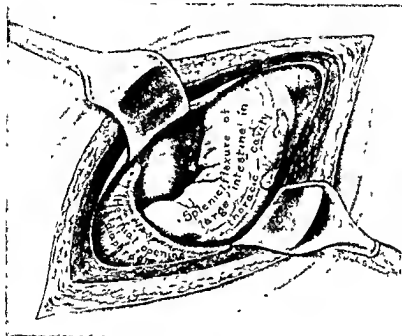


Fig 535

chest was tympanic, and the breath sounds could be faintly heard. There was, however, an occasional "gurgling sound" in the chest, and a diagnosis of hernia, which had been suspected, was confirmed by x-Ray findings. The accompanying roentgenogram (Fig 533) shows clearly a portion of the splenic flexure of the colon in the left thoracic cavity.

This case is one that is ideal for surgical treatment. The patient is placed on the table on his right side. A sandbag is

put in place along his back to keep him from rotating, and under the right side to separate the ribs. The entire left chest and upper abdomen are prepared. The abdomen is covered with a sterile towel.

A long incision is made to the pleura between the seventh and eighth ribs, and is carried well forward. In this case the

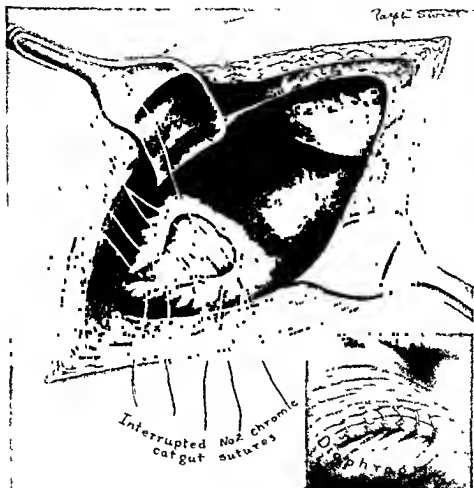


Fig 536

ribs are well separated. The intercostal muscle is cut, the pleura opened by a small nick, and the pressure slowly equalized. Positive pressure anesthetic should be available at this point, if necessary. The pleura is then opened to the size of the skin incision. It is possible to get sufficient exposure in this case

without a resection of the ribs. Edges of the wound are strongly retracted. The protruding bowel is easily accessible. The opening in the diaphragm is carefully enlarged, and the bowel replaced in the abdominal cavity. In case reduction is difficult the patient could be slightly turned and a high incision made into the abdominal cavity. The traction could thus be easily made from below.

The edges of the opening are freshened and the wound in the diaphragm is closed by suture with chromic catgut. The type of stitch is immaterial, as long as the approximation is good. The chest wound is closed without drainage. As much air as possible is removed by suction through an aspirating needle. The remaining air in the thoracic cavity is later absorbed, and the lung assumes its normal function.

Diaphragmatic hernie in themselves do not necessarily cause any great amount of discomfort, but, in view of the grave danger of strangulation, prompt surgical repair should be done. Cases should be carefully selected and the surgeon should not hesitate to use both the thoracic and abdominal routes if necessary.

CLINIC OF DR JOHN B McNERTHNEY

SAINT JOSEPH'S HOSPITAL, TACOMA, WASHINGTON

A SUSPENSION TECHNIC IN THYROID-GLAND SURGERY. SARCOMA OF THE THYROID GLAND. CARCINOMA OF THE THYROID GLAND

A SUSPENSION TECHNIC IN THYROID-GLAND SURGERY

THIS morning we intentionally did not bring in our first patient, until I had a chance to explain to you the principles of the technic we have been using in our goiter work.

For some years, my brother, W B McNerthney, and myself have been developing helpful features in our goiter technic, and at the same time eliminating what seemed unnecessary steps. You will notice the operating table has been supplied with a special ratchet, so that the tips of the goiter rack sit obliquely. The goiter rack is made of a $\frac{3}{8}$ inch, square steel bar. We selected the square type of goiter-bar, because a square mouthed clip fits it snugly and firmly. You will see during the course of operation how these clips hold in place our special drapes (Fig 537).

The next features are the clip hook tenaculum, and the two lateral spring swivel retractors, all going to make up what might be called a suspension technic (Fig 538). Drapes, skin and muscles can be hammocked up and out of the way during any thyroid operation.

The principles of the method were developed in a period of necessity—not from choice. Today the technic proves so simple and practical that it is retained and becomes a method of first

choice It is strikingly interesting to see how attention to minor details can make a hazardous major operation a safe and simple procedure with even better exposure, and all accomplished with less help, which is no small item in many hospitals. Sometimes just a little change or improvement in technic means so much in the end-results. You all know what Plummer did in goiter work. He showed us what a little change in technic, even in an incompletely iodized thyroxin molecule, by the use of Lugol's solution, would do in exophthalmic goiter. Just a small change in technic giving better wound exposure prevents many of the

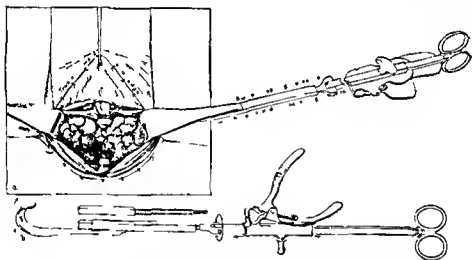


Fig 538 —a, Exposure by use of hook tenaculum and swivel spring retractors, b, construction of swivel spring retractor

surgical disasters that occur in operative surgery of the thyroid gland. The skin, subcutaneous tissue, and platysma are the surgical draperies that must be held out of the way during any thyroid operation. This is easily done by the use of the clip tenaculum (Fig. 539).

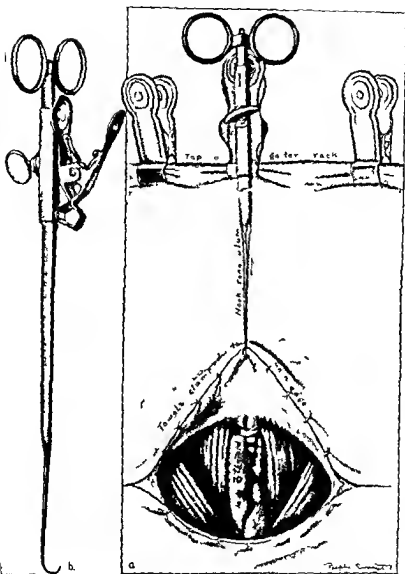


Fig 539—*a* After clamping the skin edges with the towels the upper flap is grasped with tenaculum and clamped to gutter rack by author's special clasp *b* Clip hook tenaculum

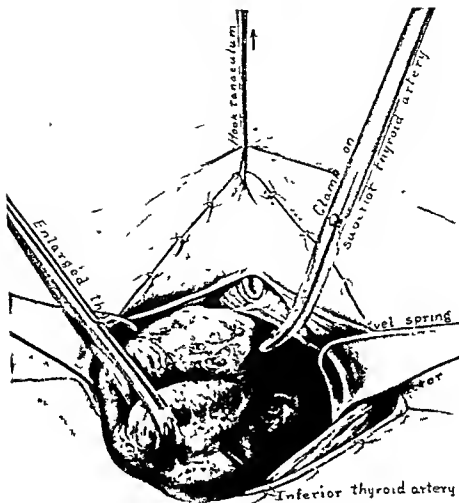


Fig 540—Skin and platysma are hammocked as in Fig 539, and the author's method of retraction gives uniform exposure to the thyroid gland

SARCOMA OF THE THYROID

Sarcoma of the thyroid is rare. Wilson, of the Mayo Clinic, called our attention to the fact that American surgeons were failing to report malignant tumors of the thyroid gland. Only 971 malignant tumors had been reported by them up to August, 1921. In the last few years a great number of surgeons and pathologists have been looking for that condition, and a care-

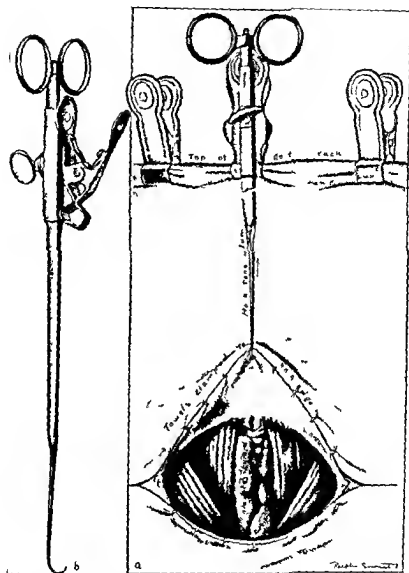


Fig 539—*a* After clamping the skin edges with the towels the upper flap is grasped with tenaculum and clamped to goiter rack by author's special clasp *b* Clip hook tenaculum

domen shows somewhat enlarged liver, gall-bladder is tender. The right rectus is somewhat rigid. No epigastric or other herniæ. Vaginal examination shows a quite marked cystocele. Urine is free from albumin, sugar, or pus. Shows few hyaline casts. Blood Wassermann negative. Basal metabolic rate, +14.



Fig. 542.—Sarcoma of thyroid gland. Section through specimen. Note the calcified areas and sarcomatous tissue, surrounded by well-defined capsule.

Complaint.—This long-existing goiter now suddenly, without warning, has begun to grow rapidly, producing pressure and coughing spells, especially when patient is lying in a certain position. Neuralgic pains are present in left shoulder. It is interesting to note that this patient complains of a sciatica of the left hip, causing a distinct limp. The significance of this is im-

portant from the well-known fact that thyroid tumors give rise to bone metastasis in the vertebræ, even producing pathologic fracture of the neck of the femur. The neuralgia in the patient's arm has become so unbearable that the patient has sought relief.

Operation.—With $\frac{1}{2}$ per cent. novocain we will block the nerve supply to this goiter. The *nervus cutaneus colli* arises from

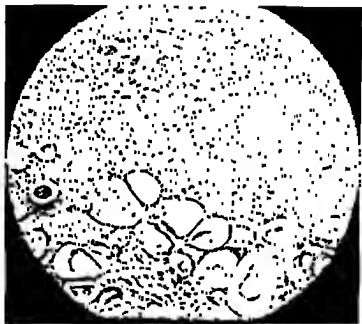


Fig. 543.—Section through solid area, showing spindle-cell sarcoma invading the colloid area.

the second and third cervical nerves. It climbs the posterior margin of the sternomastoid muscle, and passes transversely forward, supplying the platysma, in part, and a large cutaneous area on the anterolateral surface of the neck. Drop a vertical line from the center of the mastoid process, meet this with a transverse line from the mental protuberance of the inferior maxillary bone, and exactly at the intersection of the two lines, within an area the size of a ten-cent piece, will be found the

nerve. There we place sufficient novocain solution to intercept the nerve trunk. Each goiter-pole we also infiltrate with sufficient novocain to anesthetize these areas

In our goiter work we always select the presternal notch as a fixed anatomical point, and the clavicles as the crossarms. By extending our incision equal distances right and left of the presternal notch, and a little above the clavicles in a natural crease of the neck, the scar is not objectionable

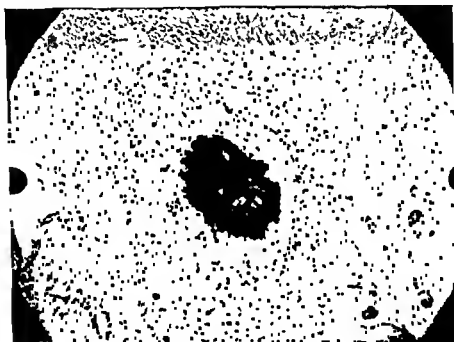


Fig. 544 —Microscopic section of calcified area in center of sarcomatous area

Incision —Now we have the skin, superficial and subcutaneous layers, dissected up. We tie every small bleeder. Our scheme of retraction places the flap before us during the whole operation so that no bleeder escapes us. Now the skin and towel are clipped together with these small towel-clips, and veiled backward over the rack in front of the patient's face, and pulled taut. This lifts the skin and platysma well up. This is, as you see, pinned above by the use of the special clip. Now at this point we grasp the center of the upper flap with our clip tenaculum (Fig. 539) and it is clasped up on the goiter rack. You see, this

greatly increases the working area and the skin flap is well out of the way until our operation is nearly completed

Our wound is free of any metallic material which gives greater freedom to the finger's touch as I sweep my fingers under the sternohyoid and sternothyroid muscles and over the surface of the gland separating exploring and locating the normal and pathologic points of interest. The ribbon muscles of the neck are now well separated and as you see somewhat flaccid so it will be unnecessary to divide the muscles. We slip the blades of the lateral spring swivel retractors in close to the gland under the capsule and ribbon muscles of the neck and the vertical bar of our goiter rack furnishes a splendid support for the clips of our swivel retractors. Notice the spring retractor holding the wound wide open as if held by hand (Fig. 538).

This type of retraction eliminates one or two assistants which is quite an important factor in some of the smaller hospitals. You see how these few simple measures facilitate the surgical treatment of goiter.

I believe we can remove the gland without dividing the muscles. With our upper flap up and out of the way see what splendid exposure we have especially of the superior pole. When the superior pole is exposed freed and ligated the hardest part of any thyroidectomy is completed. In exophthalmic goiter a segment of that portion of the thyroid is too frequently left and accounts for recurrence.

This hard door knob type of goiter with distinct capsule and calcareous deposits in the center looks and feels malignant.

The frequency of malignancy of the thyroid gland like cancerous disease in general is proportionate to the number of patients drawn from the fifth to the seventh decade of life.

This is especially true in pioneers of the Pacific Northwest. With the approach of old age there are frequent areas of calcification in these thyroid glands. They seem to us to act as constant irritants to the thyroid tissue and irritation is probably the most causative factor in malignancy. You will remember that Balfour called attention to a number of cases of malignancy

occurring in large thyroids that had been treated previously by injections of various irritants

You see we have taken away practically all of the thyroid gland leaving very little of anything except the posterior capsule and the vitally necessary parathyroids. We know the recurrent laryngeal nerve is uninjured for our patient's voice is good and there is no impairment of respiration.

The postoperative treatment of these aged goiter patients is most important. This patient will be put on a Fowler bed. She will be given fluids as best tolerated. We will if necessary resort to intravenous injections of glucose and insulin as a life saving postoperative measure. This operation should extend the patient's life one to three years.

CARCINOMA OF THE THYROID GLAND

Carcinoma of the thyroid gland is intertwined with embryonic fetal cell life. Meleney of Pekin, China, has well said 'The thyroid gland continues to claim the interest of many branches of medicine because of the secrets hidden in its physiology and pathology.'

It is not now a secret but a well established fact that administration of iodine to the pregnant mother prevents the development of fetal adenoma in her offspring. A very high percentage of these cases of malignancy originate in fetal adenoma.

History—Mrs. T. age sixty seven. Mother of four children all living and well. No evidence of goiter in any member of the family. This patient too has lived in the Pacific Northwest since childhood. *She was born in one of the European goiter districts.* As long as she can remember she has had a small growth of the thyroid gland. It remained dormant all of her life until 1914 when it grew rapidly and she had it removed elsewhere.

Physical Examination—The malignant recurrence of carcinoma is apparent to you all. The usual contraction of the pupil and narrowing of the palpebral fissure due to the paralysis of the ocular branches of the sympathetic nerve so often found in this condition are absent.

However note this small tumor mass external to the sterno thyroid and sternohyoid muscles. Over her chest we see again the distension of superficial chest veins.



Fig. 545—Carcinoma of thyroid gland

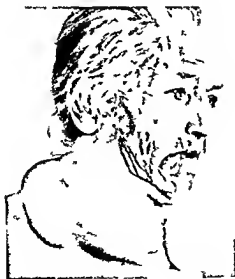


Fig. 546—Carcinoma of thyroid gland

On percussion her right supraclavicular region gives a marked dulness—doubtless due to the substernal location of the right lobe. The location of the growth is confirmed by the fluoroscope. The trachea is markedly displaced to the left. Her heart is negative, sounds are good, pulse is slow.

Abdomen, especially the liver, is free from any palpable nodules or growths. x-Ray shows no evidence of metastasis in

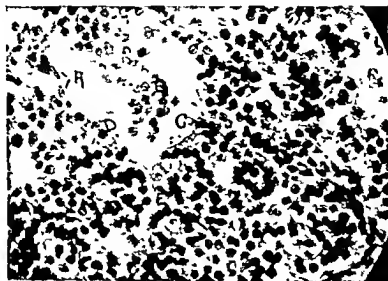


Fig 547.—At *A* two endothelial cells of the thin walled blood space are seen. *B* shows tumor-cells free in the blood-space while at *C*, a mass of tumor-cells are extending into the blood-space from the outside. At *D*, tumor-cells are separated from the blood-space by very delicate connective tissue suggesting that slight pressure (swallowing) might break the vessel wall and release live tumor-cells in the general blood stream. *E* shows the delicate type of embryonic connective tissue, holding together the clumps of epithelial cells. There is no evidence of colloid formation.

the chest, vertebrae or long bones. Blood Wasserman negative. Basal metabolic rate is +12.

Complaint.—The outstanding complaint is obstructed breathing, radiating pains in her arms and chest. She came to the hospital, begging for relief of the unbearable pressure that is rapidly encroaching upon her trachea.

Dr Egan gives the patient a light nitrous-oxide anesthesia. Dr Egan is a pupil of Dr John Lundy, formerly of Seattle, but now chief of the Department of Anesthesia, Mayo Clinic.

We have everything ready, and are prepared to do a tracheotomy should the occasion demand. In this case we have no positive knowledge of metastasis in distant organs, but even then and always, unless at a terminal period, repeated operation is justifiable in malignant goiter growths.

We shall make our incision higher than in the non malignant type of goiter. We now take off the small thyroid muscles, with the malignant nodule that is external to them.

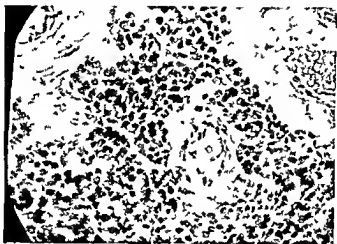


Fig 548—This shows a high magnification of area A B Fig 547. The epithelial cells do not show follicle formation with colloid. Many of the nuclei show hyperchromatosis.

With our upper flap well held up and out of the field, this gives us a splendid exposure. Kocher, the real father of goiter surgery, was removing malignant goiters in 1911. When I visited him at Berne, Switzerland, the principles he—taught early removal of benign growths, early extirpation of suspicious growths before the capsule has ruptured—we adhere to today.

We here remove this large growth without getting into a large venous sinus. We are always prepared for a severe hemorrhage in this type of gland. Should we get into a large vein and be unable to ligate or control the hemorrhage, we immediately place in the space occupied by the goiter a corresponding

sized spool of tape that has been dipped in sterile dental varnish. This makes an excellent method for producing constant compression, and readily stops the hemorrhage. Later the tape is withdrawn from the center of this spool, and the space is gradually obliterated.



Fig. 549—Carcinoma of thyroid with mass of calcified area, also showing calcified area severed transversely resembling lumen of trachea.

Just a word of warning—I just want to mention one more point in removal of malignant goiters. It is this. That the calcified areas throughout the gland look and feel like trachea. When severed transversely, one of these calcified masses has a distinct, calcareous rim with excavated center, and it strongly resembles the trachea. The trachea is nearly always displaced

in cases of malignancy of the thyroid and it is well to bear this point in mind as it may prevent a fatal shock to the patient and shell shock to the surgeon

It was our privilege to get the gross specimen from the original thyroidectomy in 1914. It proved on microscopic examination to be a fetal adenoma with beginning area of carcinoma. Dr McColl, our pathologist, reports the specimen we have just removed to be positive carcinoma.

If you will examine microscopically a series of these malignant thyroid specimens you will often find tumor cells free in the blood spaces and again tumor cells are separated from the blood spaces by a very delicate connective tissue suggesting that the usual massage given by some modern cults is a very bad practice as it too often releases live tumor cells into the general blood stream.

In our own cases of malignancy of the thyroid especially the sarcoma we could not help being surprised at the limited degree of cachexia certainly not anything compared to malignancy of the alimentary canal.

However metastasis is not uncommon and often shows some marked peculiarities. It was Zadek who reported a pathologic fracture of the neck of the femur due to thyroid metastasis and it was Bennie called our attention to the fact that metastasis is occasionally caused in the intestines. The masses appear as polypoid growths and have been known to cause acute intestinal obstruction.

In one of our own cases of fetal adenoma there was a marked disturbance or absence of some very vital internal secretion. Her whole human masonry seemed to crumble and she suffered a number of pathologic fractures. We removed her fetal adenoma and her structural skeleton was soon restored to normal.

CLINIC OF DRS ALANSON WEEKS AND
G D DELPRAT

CHILDREN'S HOSPITAL, SAN FRANCISCO

CONGENITAL INTESTINAL OBSTRUCTION: ATRESIA OF
JEJUNUM. REPORT OF TWO CASES

CONGENITAL obstruction, or atresia of the intestine in the newborn is sufficiently rare, and its etiology still attended with so much discussion, that it seems worth while to present a clinical study of the following case

This patient was born at Reno, Nevada, on April 22, 1927, full term, normal delivery There is said to have been an excessive amount of amniotic fluid, and also an excessive amount of vernix caseosa There were no external signs of abnormality on the infant, who appeared to be perfectly well during the first twenty four hours There was no meconium passed by rectum

April 23d Took breast milk and water during the day Appeared entirely well, except that there were no bowel movements In the evening, the baby vomited material which is said to have "looked like meconium"

April 24th Throughout the day the child appeared to be entirely well, took water and breast milk which were retained Still no bowel movements

April 25th Given olive oil enema in the morning and also colon irrigations as far as possible It was noted that only about 1 or 1½ ounces of material would enter the rectum, and it was then returned Some fragments of inspissated mucus were obtained, which were said to have been quite hard in character During the morning the child was also given castor oil but this was vomited shortly afterward Later in the day some

brownish material was passed by rectum, and the baby continued to vomit small amounts during the evening

April 26th Continued vomiting small amounts throughout the day No further passage from the rectum In the evening the child was taken to San Francisco by train, where it arrived on the morning of the 27th

Examination at the hospital showed a five day old baby, well developed, and apparently in good condition The child was vomiting small amounts of brownish material which looked like old, curded milk, but did not have a foul odor While under observation some slimy, brown material was passed from the rectum—only a small quantity Visible peristaltic waves were present over the abdomen, which was moderately distended The waves seemed to pass from the left to the right, in the upper abdomen and down toward the right flank The child occasionally cried out as if in pain, but most of the time was quiet There were no evidences of malformation or abnormalities as far as could be seen

The infant was immediately given injections of 3 per cent glucose into each axilla, 100 c c in all, preparatory to operation In view of the absence of definite bowel movements, and the persistence of vomiting a diagnosis of congenital intestinal obstruction was made The fact that some bowel movements, which were of a brownish color, had appeared following treatment, however tended to complicate the diagnosis This point will be referred to again later It appeared evident that the child was suffering from a complete, rather than a partial obstruction, for the relief of which operation was decided upon

Operation —Midline incision is made even with the umbilicus On opening the peritoneum a widely distended portion of the intestine, at least 1 inch in diameter, immediately presents This is drawn out of the wound with care and followed distally, and is found to terminate in a rounded end, something like the end of a test tube The mesentery appears perfectly normal and terminates also at this point, from which it can be traced to the mesenteric attachment On drawing up this blunt end and looking into the abdomen, the proximal end of the distal

portion of the intestine is seen. This portion of the intestine is about $\frac{1}{4}$ inch in diameter and is supported on the mesentery, which abruptly terminates in exactly the same manner as the other portion (Fig. 550). The remainder of the ileum is coiled



Fig. 550—The pin in the upper part of the picture is through the stomach, attached to which can be seen the rudimentary omentum. The three large loops of intestine seen in the foreground represent the upper jejunum, which terminates at the bottom of the last loop. The gap between the two portions is well shown.

The remainder of the small intestine is seen just to the right of this gap, and in the space between the first and second loops of jejunum.

The small caliber of the transverse and descending colon is seen from the portion of colon shown between the spleen and the first loop of the jejunum.

in the left lower quadrant, and uniformly of very much smaller than normal size. Further exploration is not done.

The upper end of the collapsed small bowel is anastomosed to the distal end of the proximal, dilated segment with a lateral anastomosis. There is great technical difficulty in making the

anastomosis on account of the extremely small size of the distal segment

To insure the patency of the anastomotic opening, a small incision is made in the side of the proximal dilated segment, and a Mayo clamp is passed through this incision and through



Fig. 651.—The mesenteric attachment of the intestine has been divided. The distended loop of bowel extending from the stomach to the point of atresia is shown. The remainder of the jejunum is somewhat contracted longitudinally as well as in transverse diameter. The small appendix is seen pointing toward the termination of the colon. A rudimentary omentum is seen suspended from the transverse colon.

the anastomotic opening into the distal segment. The blades of the Mayo clamp are spread somewhat and it is noticed that the wall of the contracted portion stretches quite readily, but is so thin on stretching that the blades of the clamp are clearly visible through the walls of the intestine. The small opening

in the side of the dilated portion is then closed, and the abdomen closed with through and through dermal sutures, without drainage

Following the operation, the child received 40 c c of normal saline, 20 c c in each thigh and the stomach was washed while still under the influence of the anesthetic. In the evening the stomach was washed again, and considerable material, which appeared like curded milk was washed out. The baby's pulse was poor, she was cyanotic, and breathing was of the short, panting type. Following the gastric lavage there seemed to be an improvement in the pulse and respiration.

Later in the evening, 3 per cent glucose was injected into each axilla. The condition of the child had appeared to be fairly good, but she expired suddenly at 1 A. M. (fourteen hours after operation).

Autopsy—Baby, five days old. Body heat still present. No postmortem rigidity. Abdominal cavity opened through the old operative incision, which was extended. No abdominal fluid. Peritoneal surface of the abdomen was perfectly smooth and glistening. The site of the anastomosis appeared clean. The edges of the two portions of gut were glued together with very fine fibrinous adhesions.

The entire small intestine from the anastomosis down, was coiled up on the left side and in the left lower quadrant. The small intestine was very much smaller than normal, being about the diameter of a 20 F catheter. Most of the right side was occupied by the large loop of proximal jejunum, which extended down to the anastomosis, a length of about 14 inches. The entire colon was lying against the abdominal wall and appeared like a thin cord, about $\frac{1}{4}$ inch in diameter. The omentum was small and rudimentary. There were no other evidences of abnormality.

The entire intestinal canal below the anastomosis was opened longitudinally, and found to be free from any further constrictions. The rugae of the mucosa were arranged longitudinally in folds, which appeared more redundant than usual. The lumen contained particles of material which looked like typical mecon-

um being greenish in color and slimy in character. These particles were collected. A plug of this material occupied the ileocecal region and seemed packed against the ileocecal valve. This material was faintly positive for bile but strongly positive for blood which was undoubtedly due to blood which had passed down from the region of the anastomosis. The contents of the colon however appeared to be more whitish being in spissated mucus evidently and containing also some very pale green material. This was analyzed for the presence of bile and proved to be negative. There was none of the brownish material present in the colon which the child had passed before operation the reason for this probably being that the continued Murphy drip and colon flush had removed it entirely.

This case calls to mind a baby six days old upon whom one of us operated in 1916 who had a congenital obstruction of the duodenum and suggested at first a diagnosis of pyloric stenosis. However the condition came on sooner than is usual in cases of pyloric stenosis. There was evident dilatation of the upper abdomen and marked peristaltic waves and a large amount of vomiting which contained bile. Operation on the sixth day of this child's life showed a greatly dilated stomach and dilated first and second portions of duodenum in fact the appearance on opening the abdomen was that of a large hour glass stomach the constriction between the two dilated portions being caused by the pyloric ring. The obstruction was seen to be behind the mesenteric attachment being in the third portion of the duodenum. The jejunum at the ligaments of Treitz was worm like and collapsed as was the rest of the alimentary canal. The appearance of the intestine in this case was exactly the same as that of the more recent one. The jejunum was brought up and anastomosed to the stomach in the typical manner of a gastro-enterostomy. The same extreme difficulty was encountered in forming this anastomosis as was mentioned before being due to the very small caliber of the collapsed portion of the intestine. However the outcome was more fortunate in this case than in the other one for the child recovered from the operation and is living and well today.

The oldest case of this type on record is that of Osiander,¹ 1797, and a second was reported in 1808 by Aubery.² A review of the literature up to 1901 was made by Louise Cordes, and a series of 57 cases presented. Spriggs,³ in 1912, collected a series of 328 cases, and, since then, cases have been reported with increasing frequency.

Any portion of the alimentary canal, apparently, may be the site of an atresia, from the esophagus to the anus, although certain regions seem to be predisposed. The majority of cases appear to be either at the duodenum or in the jejuno-ileum and ileocecal regions. Multiple constrictions are occasionally encountered. Sixty-four cases, or 20 per cent. of Spriggs's series, were of this type.

The type of obstruction may show considerable variation. Sometimes there is merely a narrowing of the lumen of the intestine for a short distance, with all the structure of the intestinal wall undisturbed. Cases of this type, of course, might easily go on to spontaneous cure, and never be discovered except for other reasons. The case of multiple constriction of the small intestine presented by Emanuel⁴ showed several constrictions of this type.

In other cases, there may be a distinct septum of mucous membrane stretching across the intestine, blocking the lumen completely. Of such a type is the imperforate anus, but similar conditions may obtain higher in the alimentary canal.

In still other cases, the constricted portion of intestine may appear to be drawn out into a fibrous band, which may be entirely free from the normal constituents of the intestinal wall. This seems to be the more common type of intestinal atresia.

Again, the two ends of intestine may be unattached to each other, but supported on a mesentery which has a thickened edge where the gut is absent. It is more unusual for the division of the intestine to extend down and involve the mesentery, as in our case, where there is a complete division of the mesentery down to the mesenteric attachment over the great vessels of the abdomen. Regarding the contents of the intestine below

the obstruction, some very interesting observations have been made. When the obstruction is below the papilla of Vater, it is difficult to understand how bile could be present in the distal segment. Cases have been described of anomalous distribution of the bile ducts, in which branches of the common duct supplied bile to a point in the duodenum below the papilla. In other cases, however, there has been no connection between the bile passage and the lower segment, and, yet apparently typical meconium was passed by rectum. Enough cases having a congenital intestinal obstruction below the papilla of Vater and having typical meconium appearing in the stool, are on record to indicate that bile is not an essential element of meconium. The oft quoted cases of Rolleston⁵ of congenital obliteration of the bile ducts and with a first stool of meconium, and of Foster⁶ of congenital absence of the liver, with first stool of meconium, support this view. The explanation that bile passed into the intestine before the obstruction developed, seems improbable. Bile secretion commences at the third month of fetal life, and it is almost inconceivable that such a striking congenital abnormality in the intestine should not be present before that time.

The intestine above the site of obstruction is invariably distended, and the walls hypertrophic. The intestine below the obstruction is invariably collapsed throughout its entire extent, and, having lacked the stimulus of peristalsis, is very weak and underdeveloped. The expression "worm like," which has crept into the literature and applied to the appearance of the distal collapsed portion of the intestine, is very apt.

Symptoms of atresia of the intestine vary with the location of the obstruction. In atresia of the esophagus or duodenum, there is early vomiting immediately after feedings, and the condition may be distinguished with difficulty from congenital pyloric stenosis. If the obstruction be below the papilla, the vomitus would contain bile. In contradistinction to pyloric stenosis, the condition is present immediately after birth, and not developed several days later as in the latter disease. The

majority of infants of the Cordes series died at the third fourth and fifth day. Some however, lived nine days.

In this case the peristaltic waves were very different from those seen in pyloric stenosis. In pyloric stenosis the waves are found passing from left to right in the upper abdomen, and are never below the umbilicus and seldom far over in the right upper quadrant. In atresia of the intestine, however the waves are produced by a much larger portion of the alimentary canal and may therefore occupy a correspondingly larger portion of the abdominal cavity. In our case the peristaltic waves were well below the umbilicus on the right side.

With obstruction lower down in the jejunum or ileum a considerable amount of nourishment may be taken before vomiting occurs. The reason for this being that the portion of intestine above the obstruction is greatly dilated and has a considerable capacity. The absence of bowel movements are always significant. The presence of some meconium in the stool may be misleading as it was in our case for it leads one to suppose that the obstruction is not complete.

It has been stated by some writers that anuria is a prominent symptom on account of the lack of absorption of fluids from the short intestine into which the fluid is received. Our case however voided shortly after birth and as far as we can judge from the nurse's statement was entirely normal.

A brief word regarding the theories of the cause of this type of congenital intestinal obstruction.

In 1887, a theory was advanced supported by Thoremin that there occurred a fetal peritonitis which had given rise to bands of adhesions that were dense enough to strangulate and divide the intestine in certain localities and then subsiding so completely that no traces of the disease were later to be found. This theory, of course is inadequate on the face of it. Especially as other sequelæ would occur following a peritonitis as advanced is that

Bland-Sutton³ in 1889 studying cases of imperforate ileum was struck with the fact that congenital phenomena of this type occurred in regions which were the sites of important embryo

logic events Atresia of the ileum was attributed to excessive involution of the vitelline ducts the intra abdominal portions of which are sometimes seen persisting as a Meckel's diverticulum If the involution of the intra abdominal segment of the vitelline duct is excessive the result would be not a Meckel's diverticulum but a depression or a hollow at the same region or if the involution extends still further even a separation of the intestine into two portions in this particular region

He pointed out further that imperforate pharynx occurs at the region in the alimentary canal where the foregut unites with the stomodeum and imperforate duodenum occurs at the location of the primitive diverticuli which arise from the primitive duct before liver and pancreas this also being the site of complicated intestinal rotation during development

Imperforate anus similarly occurs at the junction of the hind gut and the proctodeum

Unfortunately all cases of atresia however can not be linked definitely with these particular embryologic phenomena for atresias may occur at other points than those mentioned and may also be multiple

Constrictions of the bowel occurring as a result of strangulation during the process of the rotation of the fetal intestine have also been suggested as the accidental means of the production of this condition Still other theories have been advanced and the subject is still open for discussion

We feel that unexplained developmental defect is the most probable solution of the problem

Prognosis —With early diagnosis the prognosis should theoretically be favorable However practically one is faced with a problem of not inconsiderable technical difficulty The anastomosis of such minute intestine is not easy

Richter* writing in Abt's Pediatrics was able to find 2 cases in the literature where anastomosis was done with success and adds a third case of his own which gives some indication of the high mortality

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LARGE OVARIAN CYST IN FOURTEEN-YEAR-OLD GIRL

THE purpose of this paper is to draw attention to the occurrence of a rather large dermoid cyst in a girl before puberty. Although these tumors are comparatively quite common in middle age one is not apt to associate them with the preadolescent period.

A child of fourteen years came in for examination on account of a lower abdominal swelling. She was a normally developed girl, whose past history is unessential except that she had never menstruated. Sometime before the exact date is not remem-



Fig. 552 —Drawing of the child showing abdominal enlargement

bered she noticed a swelling in the lower abdomen which was thereby made somewhat prominent. She had had no trouble with urination.

Examination showed a girl in every respect normal, healthy, and well developed. There was however a very decided enlargement of the lower abdomen and on palpating this region a firm, smooth, mass was found which extended almost to the umbilicus. The mass was fluctuant. There was no tenderness to pressure over it. The abdomen over the surface of the mass was dull to percussion. In the flanks however there was

lithotomy position and a sound was passed into the cervical canal, which showed the body of the uterus to be small and pressed toward the pelvic floor. There was a tumor above the uterus filling the pelvis, which had a distinctly cystic feeling, and which could not be elevated by pressure through the vagina.

The patient was then placed in the Trendelenburg position and a low midline incision was made. On opening the abdomen



Fig 554—Section of the tumor.

a grayish tumor presented, which reached as high as the umbilicus and was firmly wedged in the true pelvis. The end of the right tube could be seen on the anterior surface of the tumor, which was smooth, glistening, and not lobulated. A trochar was inserted into the dome of the tumor, and about 600 c.c. of clear fluid allowed to escape. This decreased the size of the tumor sufficiently to allow it to be drawn up out of the pelvis, when it

was seen to consist of a unilocular cyst of the right ovary. The right tube and pedicle of the ovarian cyst were easily clamped off and divided, and the raw edge peritonealized.

The left ovary was somewhat larger than normal, and although containing some cysts, was not removed.

The appendix was removed in the routine manner, with inversion of the stump. The abdomen was closed in layers, with out drainage.

Section of specimen, as shown in Fig 554, shows a tumor composed of a large unilocular cyst in one portion of the wall of which is a thickened mass of tissue having the typical structure of a dermoid containing sebaceous material and hair. The pathologic diagnosis of this tumor, therefore, must be a dermoid cyst of the ovary.

Two weeks after operation, the child was allowed to go home after an entirely uneventful convalescence.

She reported to us again two years later at which time she had been in excellent health since her last visit.

Pathologically, there is a close relationship between simple cysts of the ovary, dermoids, and teratoma. Tumors of this type compose the majority of lower abdominal tumors in the early years of life. A large ovarian cyst in an infant of seven months of age was recently reported by William A. Downes.¹ This was also a unilocular cyst, and was quite large. It was removed and the patient made an uneventful convalescence.

Doctor Harry I. Wiel,² in 1905, reported an ovarian cyst in a child five years old, with review of 60 cases between the ages of four months and seventy years from which study it may be seen that the frequency of this type of tumor increases as puberty is approached. Between puberty and senescence ovarian tumors are not uncommon.

Clinically, the symptoms are usually unobserved until the size of the tumor attracts the patient's attention to it.

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CLINIC OF DR CHARLES D LOCKWOOD

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THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS AND BRONCHIECTASIS

LITTLE progress was made in the scientific treatment of tuberculosis until the value of physiologic rest was recognized and applied in the treatment of this disease. The application of this principle to all forms of the disease marked a distinct advance in treatment. In pulmonary tuberculosis the recognition of the curative value of rest led to the establishment of sanatoria where bodily rest and dietetic treatment could be rigidly enforced.

Up to ten years ago the pulmonary form of the disease was regarded as strictly in the domain of internal medicine and surgical treatment was regarded as wholly unjustifiable. The first attempt to secure rest by surgical means consisted of strapping the chest wall with adhesive in the manner long and successfully employed in the treatment of acute pleurisy. Physicians have long recognized the value of pleural exudates in the healing of inflammatory conditions in the pleura and lungs. This is nature's way of inducing rest by means of compression and immobilization of the lung. It is only a step from this procedure to the artificial introduction of a compressing medium: *i. e.*, nitrogen or air into the pleural space. The experimental and clinical work of Dr John B. Murphy placed the method of pneumothorax in pulmonary tuberculosis upon a secure basis in this country.

Combined with bodily rest and sanitarium treatment, pneumothorax has been the accepted method of treating this form of

the disease up to a comparatively recent time. Pneumothorax while a minor surgical procedure has been left in the hands of the internist and of the tuberculosis specialist. It has been found that a large percentage of cases are not amenable to pneumothorax because of adhesions. These cases are the most advanced and hopeless ones. Although a strong tendency to fibrosis most favorable to healing of tuberculous cavities exists in such cases dense bands of adhesions tie the lung to the inner chest wall and prevent contraction necessary to lung collapse and the healing of cavities. These constitute the long drawn out fatal cases of pulmonary tuberculosis.

It is surprising that the value of surgery was not long ago recognized in this type of case. The obvious thing in such cases is to divide the bands of adhesions if they are well defined and few in number thus releasing the lung and allowing nature's method of healing to continue. This operation is called Pneumolysis and may be done by rib resection and under local anesthesia with little danger to the patient. It has also been done by Jacobaeus by means of a special instrument which punctures the chest wall and enables the operator to divide the adhesions under direct vision.

Patients with more extensive adhesions associated with abscesses in the upper lobe and with a comparatively sound lung on the opposite side constitute the most serious and fatal group. It is in this group however that surgery is attaining its most brilliant successes. Here multiple rib resection & extrapleural thoracoplasty accomplishes what nature does in favorable cases and what the less serious surgical procedure of pneumolysis and pneumothorax do in suitable cases.

All of these procedures conform to the same law operative in the healing of a tuberculous lung & *à* rest. Thoracoplasty allows the chest wall to fall in and compress the diseased lung thus putting it at rest and emptying the abscesses in the central portion of the lung of pus and toxic débris.

There is but one consideration that deters the surgeon in the employment of thoracoplasty and that is the deforming effect of such extensive rib resection. It should be employed only in

well selected cases where other conservative and less deforming methods have failed. It is my belief, however, that with increasing knowledge on the part of the tuberculosis specialist in the selection of cases and with improved technic on the part of the surgeon, the indications for surgical treatment will be greatly enlarged. Physicians will learn to distinguish early the type of case that inevitably goes on to a fatal termination, and which, by early surgery, might be arrested.

From my own experience I have learned to select two groups of cases which are not amenable to the ordinary methods of treatment, and which, I believe, surgery will save.

Group I—The pneumonic type with early consolidation of lung areas near the periphery, particularly in the upper lobe. These cases run a high temperature early, and owing to their peripheral situation, they do not discharge readily into a bronchus. They are also characterized by little tendency to fibrosis. The course of the disease in these cases is little modified by the ordinary sanatorium régime. They come ultimately into the advanced, hopeless group of cases with chronic abscesses which are now being operated upon late.

Group II—This group of cases is characterized by early and persistent hemoptysis. The lung involvement is not extensive. There seems to be an inherited fragility of the blood vessels, and there is little tendency toward fibrosis. Roentgenograms give little evidence of tuberculosis. Prolonged rest, hemostatics, and other medication have little effect. These patients ultimately become weakened by repeated small hemorrhages, and finally die following a massive hemorrhage.

Both of these groups, I believe, should be considered surgical from the onset, and given the benefit of early operation. In the first group, early thoracoplasty is indicated. In the second group, the first procedure should be a phrenicotomy or avulsion of the phrenic nerve. This is a simple and safe operation, and in early cases may be sufficient to control hemorrhage and check the progress of the disease. If not, it should be followed by a second stage thoracoplasty, *i. e.*, resection of the upper five or six ribs.

The indications for extrapleural thoracoplasty are (1) Advanced tuberculosis in one lung with cavitation and a relatively sound lung on the opposite side (2) Cases with extensive pleural adhesions on the diseased side in which pneumothorax has failed (3) Cases with repeated small hemorrhages uncontrolled by the ordinary method of treatment and uninfluenced by phrenicotomy (4) Cases in which the pneumothorax has been tried over a long period of time, and has not resulted in arrest of the disease (5) Rapidly developing pneumonic types of tuberculosis limited to one lung (6) The general condition of the patient must be such as to warrant the operation without too great risk. In well selected cases, from 60 to 70 per cent of otherwise hopeless cases can be assured of a practical cure.

The following case reports illustrate the type of cases which should be selected, the x ray diagnosis, operative treatment, and results.

Case I—Mrs H. B., female, age twenty nine years. American born. Husband died of tuberculosis after illness of eight years.

Diseases Scarlet fever at ten years. Influenza, 1919 and stillbirth at time. La Grippe and loss of weight 1920. 1923, tuberculous pneumonia, improvement after few months pleurisy following.

Admitted to Olive View Sanatorium April 10, 1926.

Diagnosis Far advanced, bilateral fibroid pulmonary tuberculosis chronic active Type "A." Summary of lung findings. Cavitation left apex, with predominating lesions in left lung, right fibrosis. Laryngitis pleurisy (bilateral), and history of intestinal involvement.

Temperature 98°, 99.8° F. Pulse 70 to 110, variable.

Laboratory Report Sputum positive for acid fast bacilli up to time of surgical interference, and negative since.

Urinalysis, negative.

Blood Hemoglobin, 75 per cent, white blood cells, 8900, April 16, 1926. February 14, 1927, white blood cells 13,200.

Sedimentation test October 29, 1926, one hundred and

thirty eight minutes, March 25, 1927, forty three minutes, June 9 1927, seventy minutes

x Ray report (April 13, 1926)

Right Lung Fairly well aerated, but shows rather indistinct, fine nodulation and fibrosis throughout, a little more confluent in the apex than elsewhere in the lung Diaphragm considerably flattened Comparative contraction of left thorax

Left lung shows a large oval cavity, involving the apex in the axillary portion of the infraclavicular region The rest of the

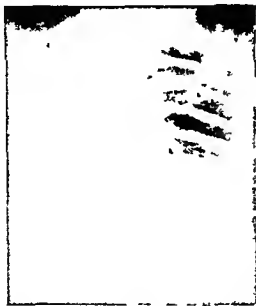


Fig 555 —Case I Mrs B Before thoracoplasty

lung is caseous and shows marked thickened pleura, and adhesions which have pulled the heart and whole mediastinum markedly to the left

Diagnosis Far advanced bilateral fibrocaceous, pulmonary tuberculosis, tuberculous pneumonia left lung, fibrosis in right lung with marked displacement of the mediastinum to the left

Artificial pneumothorax was started May 24, 1926, and carried on to October 26 1926, when it was discontinued, due to adhesions and failure in obtaining sufficient collapse Throat and gastro intestinal symptoms cleared up Rest in bed, pos

tural drainage and, pneumothorax having failed to control the disease in left lung, thoracoplasty was done. x Ray report at this time follows (October 19 1926)

Right lung in later film shows slight clearing and more fibrosis. Lung well aerated throughout, and shows no hazy parenchymatous infiltration.

Left lung shows no particular change. Lung greatly contracted, and shows dense adhesions and thickened pleura with multiple cavitation in upper lobe.



Fig. 556—Case I Mrs. H. B. After first stage thoracoplasty.

Thoracoplasty—March 8, 1927. Resection eleventh to fifth ribs inclusive. April 12 1927. Resection fourth to first ribs inclusive.

Following operations there was a slight rise in temperature 38.2°C , lasting a week after first stage, two weeks following second stage. Pulse going to 120. Both temperature and pulse have returned to preoperative fluctuations. Temperature 36.8° , 37.2°C daily. Pulse 80 to 100.

Sputum decreased to $1\frac{1}{2}$ ounces in twenty four hours. Cough lessened.

Patient is regaining weight and strength, has been home for

few days, and it is expected she will be ready for discharge within next sixty days. Sputum is negative, throat and intestinal condition are causing some apprehension, but seem to be responding to treatment at this time.

x-Ray after operation as follows:

March 18, 1927 (after low stage thoracoplasty):

Right lung in later film shows very little change, a little more engorgement than in previous examination.



Fig. 557—Case I Mrs H B. After second stage thoracoplasty

Left lung shows a partial collapse of the chest wall below the fifth rib. The collapse has rendered the chest so opaque that I am unable to tell the condition of the lung beneath.

May 17, 1927 (after second stage thoracoplasty) to compare with March, 18 1927 (after first stage thoracoplasty):

Right lung in later film shows no particular change—probably a little more engorgement, especially noted in the apex.

Left lung shows a marked reduction in size of the thorax and cavity which, of course, is due to the resection of the upper ribs. Thorax is densely opaque throughout, due to the condensation of the lung tissue and collapsed thoracic wall.

Case II—M H Admitted to Olive View Sanatorium November 7 1924 Female age thirty eight years weight 95 pounds heaviest 118 pounds Occupation office work Four sisters died of tuberculosis at twenty two twenty three twenty seven and twenty nine years respectively

Diseases Measles in childhood Tonsillectomy in 1922 Nephritis 1923 Pneumonia 1924 incomplete recovery and on set of tuberculosis April 1924

Diagnosis on admittance Moderately advanced pulmonary tuberculosis chronic active involving right lung with partial artificial pneumothorax



Fig 558—Case II M H Before thoracoplasty

x Ray at the time showed what appeared to be considerable infiltration on the right with cavitation at level of second rib
Laboratory findings

Urinalysis negative at one time only a slight trace of albumin reported specific gravity 1004 a few pus cells and a large amount of sediment

Blood February 17 1927 hemoglobin 75 per cent

White blood count, 12,100

Sputum has continued positive for acid-fast bacilli, after operation, June 9, 1927. Sputum negative.

White blood-count, 8600; hemoglobin, 75 per cent.

Sedimentation rate: December 2, 1926, seventy-six minutes, June 9, 1927, forty-one minutes.

Artificial pneumothorax was continued from November 25, 1924, to March 15, 1927. Collapse was good, but incomplete, due to adhesions in upper third. For this reason, and due to the fact that patient began to raise slightly more with loss of weight, cavity enlarged with fluid level, while over the contralateral



Fig 559—Case II M II. After first stage thoracoplasty

lung on physical examination a few coarse râles were heard over second intercostal space, otherwise no pathology evidenced, thoracoplasty was advised.

x-Ray of March 15, 1927, report as follows:

Right lung: Cavity in the apex is somewhat increased in size. Lung very slightly expanded. The long, cord-like adhesion still remains. Cavity apparently shows fluid level.

Left Lung: Infiltration extends from hilum to periphery; shows slight clearing and more fibrosis.

Looks like a fair case for thoracoplasty

April 15, 1927 (after upper stage thoracoplasty) to compare with March 15, 1927

Right lung in later film shows rib resection of the upper seven ribs near the spine, with a fairly good collapse of the chest wall. The cavity has been reduced probably 50 per cent in size, but still remains open and shows fluid level. The middle and lower lobes still well collapsed, and a long, cordlike adhesion can still be demonstrated. Below the large cavity in the infraclavicular region there is another small cavity which is not compressed.



Fig. 560—Case II M. H. After second stage thoracoplasty

Due to the compression of the chest wall there is apparently more intrathoracic pressure by the pneumothorax which is demonstrated by greater separation of the ribs and greater depression of the diaphragm.

Left Lung Shows very little change—probably a little more engorgement. There is a slight amount of infiltration extending from hilum to periphery. This however shows a considerable amount of fibrosis.

May 17, 1927 (after second stage thoracoplasty) to compare with April 1, 1927 (after second stage thoracoplasty)

Right Lung There is considerably more contraction of the thorax, therefore, more compression of the lung, and slight reduction in size of the bilocular cavity in the infraclavicular region

Left Lung Shows considerably more engorgement There may be a few tuberculous lesions lying anteriorly in the third interspace This shows in previous examination, but is accentuated now, probably due to compensatory changes

Temperature fluctuated daily between 36° and 37.4° C
Respiration 22 No other sites of infection outside of the lung were elicited

March 29, 1927 Resection of seventh to first rib was successfully accomplished under local and gas anesthesia Time of operation thirty minutes Wound healed without any trouble Patient cheerful, suffered very little pain

Temperature went to 100° F, pulse to 120 for three days, with drop back in week's time

To obtain greater collapse of cavity of right lung, a second stage thoracoplasty was done, resecting seventh to eleventh ribs, inclusive, on April 26, 1927 Pulse registered 120, dropped to 108 the next day Temperature 36.8° to 38.1° C gradually returning to 36.8° to 37.2° C daily variation, pulse 90

Patient still in sanatorium

Sputum about 10 c c daily, negative

Patient apparently doing well

July 3, 1927 Examination reveals infiltration of lower two thirds of left upper lobe, also slight fluid in right with air, using about one third of lung still cavity dry, but not more than two thirds collapsed

Prognosis of patient guarded

Case III—Mrs M, female, age twenty two years, weight 96 pounds American born Attractive, intelligent

Married, and has healthy nineteen month-old girl

Onset of trouble six years ago Tonsillitis, partial removal, also pneumonia, followed by pleurisy and present condition

First admitted to Olive View Sanatorium March, 1925, for

posterior trunks and branches. There is considerable constriction of the chest below the fourth posterior rib, due to resection of the ribs below this point. Lung not well compressed, and I can still make out bronchial dilatations in the base.

Left lung shows no change. No infiltration noted.

June 17, 1927 (after second stage thoracoplasty) to compare with May 16, 1927 (after first stage thoracoplasty).

Right lung in later film shows resection now of all the ribs with a fine collapse. Some hpiodol still remains in the upper bronchial trunks and branches.

Left lung shows no particular change. Probably a little more shifting of the heart to the left.

Following two stage thoracoplasties, cough and expectoration practically are nil, offensiveness also has disappeared.

Temperature, daily fluctuation 98.8° to 99° F. Pulse, 78 to 80. Occasional rise to 100. Respiration, 20. General reaction to operation good.

Complains of some discomfort in right arm, and skin feels numb. There are no motor disturbances. The surgical collapse is thought a success.

The patient is to wear a special binder for six months and has been discharged to her home, conditions there being very good.

Case IV—Mrs L. F., age thirty seven

Past History. Two normal births. Pneumonia at age of twenty one. Abdominal operation nine years ago for ovarian cyst. This patient had tonsillectomy in 1926, under general anesthesia. She failed to make a prompt recovery, and was acutely sick with what was thought to be pneumonia. After several weeks of profound prostration she began to expectorate large quantities of pus.

Present Condition. Patient is slightly dyspneic, she expectorates several ounces of pus daily by lying on her left side. She runs no fever now, but feels nauseated at times and short of breath.

Examination. Fair, healthy looking woman, except for cyanotic appearance. Blood pressure, 112. Height, 5 feet 4 inches.



Fig. 564—Case IV Lipiodol injection Outlining abscess cavity. Some of the oil entered the left bronchus, and normal appearance of this lung is shown as compared with right.



Fig. 565—x R 13 after lipiodol injection six weeks' later. Shows little change but more definite saccululation in the terminal bronchi.

Weight 128 pounds Head and neck are negative Chest Left lung seems quite normal The right lung on auscultation reveals many moist râles particularly over the lower lobe posteriorly The heart is slightly dilated heart tones weak

x Ray Examination Stereoscopic radiograms of the chest were taken after the injection of 20 c c of lipiodol through the posterior pharynx with the patient inclined to the right There is marked dilatation of the primary and secondary bronchi



Fig 566 Showing scars of two-stage thoracoplasty

around the hilum of the right lung with some degree of sacculation and apparent fusion of lung cells with destruction of tissue The x ray diagnosis Bronchiectatic abscess in the region of the hilum of the lower lobe right lung (see Figs 564 565)

Treatment Patient has been given injections of lipiodol at intervals of three to six weeks and daily postural drainage of the abscess cavity She has greatly improved and sputum has diminished in quantity Prognosis for complete recovery without operation is not good

Another type of lung infection which has long baffled both internists and surgeons is bronchiectasis. These cases are always of long standing dating back to some acute infection followed by bronchitis and chronic cough. Such lung infections are very often the sequelæ of measles or whooping cough. At first periodic in character the bronchial cough becomes almost continual. The sputum at first mucopurulent and only slightly offensive finally becomes fetid and very abundant. Coincident

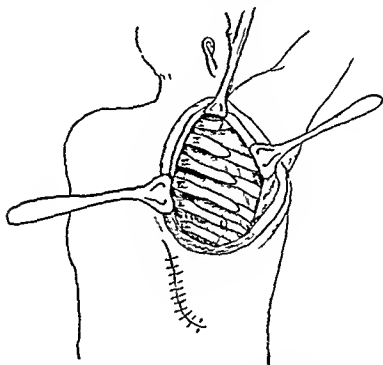


Fig. 6" —Showing technic in upper stage thoracoplasty

with these symptoms there is a gradual dilatation of the inner bronchi and alveolar spaces of the lungs; there is a great increase in the epithelial cells with sacculization of the terminal bronchioles.

There is a distinct type of bronchiectatic abscess following the aspiration of infected material from the nose, throat and sinuses. These cases are more acute in character and are preceded by an incubation period of two or three weeks. They usually follow operations upon the throat under general anesthesia. The pathologic process in the lungs is more limited than

in the more chronic forms of bronchiectasis. Four or five of the larger bronchioles are dilated, and lead to a cavity containing foul pus and necrotic material. Unlike the more chronic forms in which there is merely a dilatation of the bronchi, in the abscess type there is an ulceration through the dilated bronchi and the formation of a true abscess filled with infected granulations.

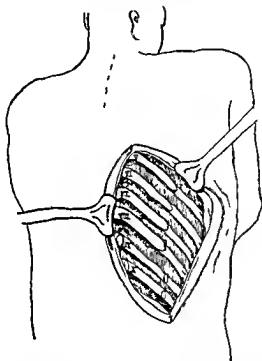


Fig. 568.—Showing technic in lower stage thoracoplasty.

Each of these types is illustrated in the above case reports. For technic of thoracoplasty see Figs 566-568. I am indebted to the Staff of Olive View Sanatorium for some of the case reports and x-ray pictures.

CLINIC OF DR A ALDRIDGE MATTHEWS

ST LUKE'S HOSPITAL, SPOKANE, WASHINGTON

EXOPHTHALMIC GOITER

MRS P R, white, female, married aged twenty four Consulted me first March 31, 1927

Family and past history of no consequence Been nervous for some time Noticed six months ago that this condition was getting worse continuously Weight, 110 pounds Has lost over 20 pounds Has an exophthalmus 2 plus scale of 4, a decided digital tremor, very nervous, constantly moving hands and feet a sense of heat, shortness of breath upon exertion, associated with heart palpitation, quite audible to her, especially at night, a flushing of the skin about the face and neck, great weakness in her knees, unable to step upon a low stool Skin always moist Thyroid enlarged symmetrically, about four times normal size This enlargement has all developed in past month, according to her statement Gland is firm to the feel, pulsating, and a distinct bruit can be heard at both upper poles

Pulse, 150 per minute Heart dilated Could detect no murmur Feet began to swell three or four weeks ago, very marked now

Urine 2 plus albumin otherwise negative

Metabolic rating plus 90 2 per cent

Patient was sent to St Luke's Hospital where she remained eleven days, taking Lugol's solution, 10 drops three times a day, and luminol 2 grains every evening Was kept in bed with the exception of two hours a day, allowing her to sit up one hour in the morning and one in the afternoon Was sent home with

strict rules and regulations as to her care, and to continue medication as before, she living some distance away in Idaho

On April 24 1927 reported again Condition considerably improved in every way Metabolic rating plus 79.1 per cent Pulse ranging from 100 to 130 Much less nervous Sent her home again after keeping under observation for three days, to continue as before in regard to rest diet and medicine



Figs 569 570—Exophthalmos and enlargement of thyroid all developing within two months

On May 10th returned and under observation for a week at the hospital pulse ranging from 100 to 120 General condition about the same as when seen last Metabolic rating plus 62.5 per cent At this time as there had not been any definite improvement in the past two or three weeks thought it advisable to do ligation and did so on May 11th expecting to do one side As there was no definite reaction ligated both superior poles under novocain Following this there was a slight reaction Pulse went to 140 and temperature next day 100.6° F, but by the second day condition same as before

She again went home and remained until June 8, 1927. At this time condition seemed unchanged over former trip, metabolic rating had gone up, being plus 70.2 per cent. Ligation wounds healed primarily, there being no definite improvement, her weight same as it was when first seen, and pulse ranging around and above 100.

As she stood the ligation well, which was done largely as a try-out to see what her tolerance was, it was felt safe to remove at least one lobe of the thyroid. This was done on June 13, 1927, under gas anesthesia. Pulse went to 160 during the operation, she reacted well following, and at no time was in a critical condition. Took three days to get back to condition she was in before operation.

Following the operation Lugol's solution was administered, 10 drops every six hours, by rectum, and morphin sufficient to control nervousness. Ice-caps were kept on cardiac area, and over both groins, as she complained much of being warm. This was continued about forty-eight hours.

On June 21, 1927 removed left lobe and isthmus. Pulse went to 170, always regular, and color good. She reacted more quickly from this operation than the previous, carrying on same postoperative treatment as at former operation. She was able to leave the hospital on July 3, 1927, generally improved in every way, pulse around 80 to 90 for the last few days before being discharged.

This is the first time, since Lugol's solution has been popular in the preparation of exophthalmic goiter for operation, that I have resorted to ligation, although on several occasions I have removed one-half the thyroid gland, and, after a few days, the remainder. Ligation is only necessary in extreme cases, and then it is more of a test of the patient's tolerance to operative procedure than of real value in reducing the blood-supply. Boiling water injections still hold a very limited field in these exceptional cases.

The after care in such cases is very important. A definite program should be prescribed for the patient in regard to rest, diet, avoidance of exertion or irritations of any kind, etc. I

give these people a printed set of rules to be strictly followed for at least two months keeping them on Lugol's solution 10 drops two or three times a day (depending upon the seriousness of the case) for a month then reducing to 5 drops two or three times a day and occasionally continue medication longer. These cases should be kept under observation for at least six months.

CANCER OF STOMACH

Mr. A. F., white, aged sixty-three, farmer, weight 152 pounds. Past year has lost a little weight. Eight pounds in last two months.

Past and family history of no consequence. Denies any cancer history in family.

About one year ago began having a burning sensation in the stomach when empty. Character of food made no difference. Occasionally would spit up bitter, acid material. With this meager history it was impossible to come to any definite diagnosis, but with the x-ray a diagnosis was made: "Extensive filling defect in prepyloric region, probably malignant in character. This filling defect was constant during two fluoroscopic examinations, and is shown in all films. Hypo-acidity of stomach contents, no blood present."

On May 5, 1927, midline high abdominal incision was made, which revealed a pyloric growth in the stomach. A general exploration of abdomen showed no enlarged glands or metastases. A gastric resection was done, removing about the distal half of the stomach, the pylorus being divided at the middle of its first portion and inverted. A Polya anastomosis was made. The mesentery was sutured to the stomach, just distal to the anastomosis. Patient was put to bed in semi-Fowler position and given proctodysis (tap water) for the next three days, by the Murphy drip method. Everything was restricted by mouth until the third day, when allowed 1 ounce of water every two hours. From the fourth day liquids increased gradually up to normal quantity. Patient did not vomit a single time, but hiccupped at short intervals for three days, but this, at no time, was of any real consequence.

Patient left the hospital on the fourteenth day following operation. Has gained in weight, is eating all kinds of bland food, and feeling fit. It is now six weeks since the operation.

The following is a laboratory report from St. Luke's Hospital laboratory by Dr. Stier

Gross appearance of specimen Specimen consists of a portion of stomach which measures 12 cm. in length and at its widest point is dilated to 5 cm. The serosa is moderately thickened at irregular intervals by fibrous tags. Within the mucosa near the pyloric extremity there is a crater-like ulcer which measures 3 cm. in diameter. About this crater the mucosa is heaped up and there is some undermining. The floor of the crater is apparently devoid of epithelium and covered by grayish slough. The wall at this point measures 1 cm. and elsewhere measures 1.5 cm.

Microscopic examination revealed a chronic ulcerative gastritis with an adenocarcinoma within the floor and margin of the ulcer.



Fig. 571.—Carcinomatous area found in edge and floor of ulcer

I am fully convinced that gastric resection is the operation of choice in chronic ulcer of the stomach and always in malignancy when conditions warrant but am far from being convinced that it is the operation of choice for chronic duodenal ulcer as is being recommended by so many men today. I prefer resection

of ulcer when possible, with some sort of plastic operation between stomach and duodenum, or resection of ulcer with a posterior gastro enterostomy, leaving the major procedure for later



Fig 572 —Gross specimen of stomach, showing inner surface with ulcer

if this does not suffice, which it will do in 85 to 90 per cent of cases. Gastrojejunal ulcer is far less frequent in my experience than is reputed in many statistics.



COMMON-DUCT OBSTRUCTION

H F L, white, female, married, aged forty two Came under my care June 15, 1927

Family and past history of no consequence Present trouble dates back to last April Previous to this had occasionally a little gastric disturbance and gas, but of no real consequence, and considered herself as having a good stomach Since April, has had an intolerance for fats and acids Had an attack of mild cramps in upper abdomen about this time From this time on until June 12, 1927, has had several slight attacks of cramps, but not lasting long or keeping her from her usual duties On this date had severe cramps which were referred principally to her back under the right shoulder blade, also to the right upper belly, making it necessary to call her home physician, who gave her a hypodermic of morphin From this time until the operation there were four light attacks Denies jaundice, and has had no vomiting

Physical examination negative, except a mitral stenosis, a sallowness of the skin, simulating a very mild icteric tinge, but not involving the sclera, a distinct tenderness over upper right abdomen

Temperature 99° F Pulse 110

Laboratory Report Bibrubin, 10.5, coagulating time, two minutes five seconds, bile index 36.5, bleeding time, two minutes four seconds, urine, negative

Operation June 16 1927 Right perimedial incision, reflection right rectus to the right Exploration of abdominal cavity negative except condition in right upper belly, prophylactic appendectomy was done

Upon exploring gall bladder area found a small nubbins like sac about the size of a hazel nut which appeared to be the fundus of the gall bladder, then a constriction connecting what seemed to be the gall bladder proper Upon further investigation

found that small sac was all that was left of the gall bladder the remainder being a fibrous cord extending to a much dilated common duct about $\frac{3}{4}$ inch in diameter Upon opening released a quantity of white bile which was streaked with pus An exploration with index finger could easily be made and the right and left hepatic duct openings could be readily felt There were several stones in the distal end of common duct one being wedged into the ampulla These were removed and a probe passed into the bowel

The common duct was sutured by interrupted sutures around a small tube which was placed in the upper end of duct and three Penrose drains placed in right kidney pouch

Removed the rudimentary gall bladder which had unquestionably not been functioning for a long while There was very free drainage from tube in duct which was placed in a bottle Patient made a good recovery leaving hospital on July 3d There had been no drainage from wound for two days before leaving hospital

It is a peculiar thing that so much pathology could occur with so little discomfort and with a short duration of real symptoms It is common to see grave and serious symptoms develop in the biliary tract especially in the gall bladder when gross pathology can only be elicited through the laboratory

Much credit is due Graham for the great help in making these diagnoses by his method of cholecystography making it possible to pick many of these cases up in their incipency and avoid much gross pathology and serious operations

DOUBLE EMPYEMA

V. R. aged five male. Family and past history of no consequence or bearing on present condition. Physical examination negative except for condition described below.

Two weeks ago December 3d child was very restless and generally miserable. Has had a cough for the past week and was



Fig. 573—Increased density throughout entire left chest. The mediastinal contents are pushed to the right—typical of fluid.

found to have a temperature of 104°F . Abdomen distended for past four days. There has been no vomiting and no history of chills or convulsions. Last night complained of pain in the upper right abdomen which has persisted since

Physical Examination Dulness throughout left chest Heart sounds heard best over sternum Respiratory sounds absent in left chest Urine negative but later developed two plus albumin Leukocyte count 13 000 at time of admission to hospital and the next day 15 000



Fig 574 —Increased density over entire left chest most marked along the periphery The area in upper part of chest having a rounded contour suggests an encysted fluid Consolidation in the right upper lobe—typical of pneumonia also some fluid in the right pleural cavity

x Ray showed an increase in density throughout entire left chest The mediastinal contents are pushed to the right typical of fluid

I was called in consultation on December 17th by Dr Barnett pediatrician, who was associated in the case throughout taking full charge of medication and diet and keeping very close check of physical condition and findings and who

deserves much credit for the outcome. On this day Dr Barnett aspirated the chest, removing a small quantity of pus which upon culture showed to be *Streptococcus viridans*. Same day I inserted a metal tube which was air tight, between ribs, with rubber tube attached allowing small quantities of pus to flow



Fig 575 —Drainage tube in place in the left chest. Left chest appears to be perfectly drained with apparently no collapse of lung. There is considerable increase in amount of fluid in the right chest.

out every three hours. This was accomplished by removing a clamp from rubber tube and reapplying it at the first sign of annoyance or cough. This procedure was continued for the next three days, then clamp was left off for long intervals. On the fourth day I began to use 2 ounces Dakin's solution in chest

cavity this being retained by clamping the tube till the next dressing which was every four hours allowing the cavity to empty thoroughly each time before replacing the Dakin's solution

On December 21st x ray of left chest showed it to be perfectly drained with apparently no collapse of the lung There

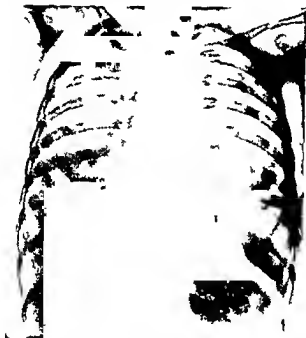


Fig 5 6 —Left chest appears to be clear of pus but there is some collapse of lung with considerable pneumothorax There is still considerable fluid in the right chest but not as much as there was one week ago Dense area in apex shows no change but may be due to encysted fluid

now being evidence of fluid in the right chest on December 22d aspirated the right chest removing $4\frac{1}{2}$ ounces of pus On the 24th aspirated 8 ounces 26th $2\frac{1}{2}$ ounces 29th 2 ounces and on January 2d 6 ounces On the third day of January one month after onset of illness placed metal tube between the ribs in the right chest which was air tight and handled the same as on the left side with the exception of the

use of Dakin's solution, as it was so irritating. While there was no bronchial fistula, yet it caused considerable pain and coughing. This did not always happen, but was the rule. Especially was it so when the child was fretting and coughing, but if used when he did not know it, as when asleep, occasionally there



Fig. 577 — Right chest is practically free of fluid, and there appears to be only a small amount in the left chest

was discomfort. The metal tube became very annoying, and child complained about it persistently, so on January 20th resected a rib, placing in a Wilson empyema tube, to which I added a tube attachment.

The child eventually made a complete recovery, being discharged on February 6th, after sixty-one days in the hospital.

On June 17 1927 I removed his tonsils and adenoids under ether anesthesia from which he recovered promptly

The chart (Fig 579) shows that for the first seven weeks the respirations were almost constantly between 50 and 70 per minute and the pulse rate 150 or above

There are many details in this case impossible to bring out as space will not permit The reason for reporting is that it is

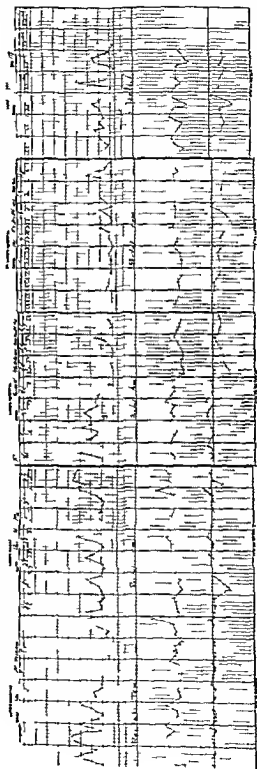
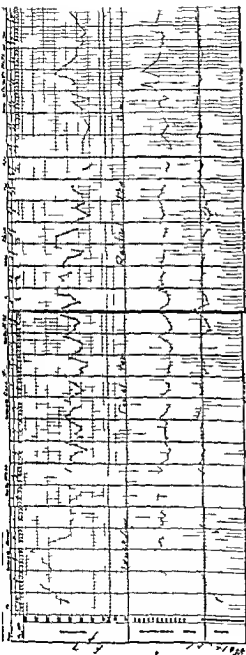


Fig 578 —Considerable collapse of left lung but fluid appears to be completely drained The right chest appears to be entirely clear but lung seems to be not fully expanded to fill the apex

unusual to see a double empyema and unusual for such to recover and the first in my experience

There are several things which I want to speak of in respect to the surgical treatment

The drainage of the chest by the closed method This can be accomplished in several ways The method used here was a small slit in the skin made after thoroughly anesthetizing the area with novocain then with a sharp pointed hemostat sepa



arating the tissues into the pleural cavity and inserting a Colton metal empyema tube which I have modified by welding an attachment to it so a rubber tube can be attached which is shown in Fig 580. Absolute control of air and fluid in or out of the cavity can be had. It will be noted that after the lung and mediastinum had become fixed a resection was done and a Wilson tube placed, this also being done under novocain.

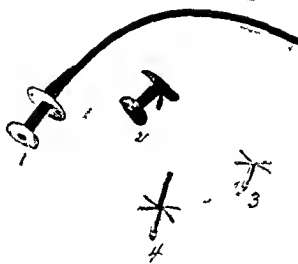


Fig 580—1 Wilson empyema tube with snugly fitted tube placed in caliber with a few sutures placed at distal end to prevent tube being pulled out

- 2 Wilson empyema tube
- 3 Colton metal empyema tube
- 4 Colton tube with welded metal attachment for tubing

This tube I have also modified by placing a tightly fitting tube in its caliber and suturing it so that it may also be made air tight and regulated by a clamp this being shown in Fig 580. When pus formed in the left chest I did not deem it safe to place a tube in at once but aspirated for a number of days.

I believe this is a safe procedure in all acute empyemas and should be carried on until the patient has acquired a certain immunity before a more radical procedure is undertaken and at

all times some air-tight device used for drainage, for the first few days, to prevent the mediastinum flapping. The pressure can also be relieved slowly to allow the chest contents to accommodate themselves to conditions.

It has never been my good fortune to be able to cure an empyema by frequent aspirations. This I have attempted several times, but eventually had to resort to the placing of a metal tube between the ribs, which I usually do in children, and resection of a rib in adults, always using local anesthesia, regardless of age, and always using a drainage which can be controlled. The disadvantage of a metal tube between the ribs is the pain it produces, and for that reason, in the above case, had to resort to rib resection. The disadvantage of a rubber tube being placed between the ribs is the great danger of it being collapsed by rib pressure, therefore making rib resection essential.

The accompanying chart will give a good idea as to the critical condition of the patient during his acute illness, and at many times the case seemed almost hopeless.

ACUTE SUPPURATIVE APPENDICITIS FOLLOWED BY PERSISTENT VOMITING

W. R. C., white, male, aged forty-four. Occupation, pool-hall proprietor. Came under my care April 7, 1927. Family history negative. Past history negative, except for years he has had what he calls indigestion, but no acute attacks.

On March 25th was taken with severe abdominal pain located in mid and upper belly. This persisted for about a day, the acuteness gradually subsiding. Vomited two or three times the first day. The second day, general pain had disappeared, but there was distinct soreness in the right abdomen, very noticeable upon pressure and motion, the location of the tenderness being on a line with the navel. This sensitiveness became less for the next few days, but never entirely leaving. Three days ago the soreness became more marked, and pain returned to the right abdomen. Bowels constipated and moved only when cathartics were taken since trouble began.

Physical examination negative except the abdomen, which revealed a distinct mass in the right abdomen, extending from just above the level of the navel down about 3 inches. Mass was sensitive and hard, located deep, and adherent to the back.

Leukocyte count, 16,300. Urine negative, except a slight trace of albumin.

Diagnosis: acute appendicitis, postcecal.

Operation: Right rectus incision, encountering many dense adhesions around cecum and ascending colon, which was thick and edematous. With much difficulty the cecum was lifted up and reflected toward midline. A small abscess and the appendix, which pointed upward, lay behind the cecum. Was able to bury the stump of the appendix in a way, but not entirely satisfactorily on account of the stiffness and thickness of the cecum.

I was fearful that a fecal fistula might develop on account of

the poor condition of the cecum it being dark in color. A soft rubber drain (Penrose) was inserted down into the pelvis and two in the suppurative area the wound being loosely closed around drains.

Patient left operating room in splendid general condition. Pulse 80. Was put to bed in semi Fowler position with large, warm wet dressings (boracic) to the wound. These were changed every three hours drainage from wound being bloody and serous the first changing after that seropurulent. During the night the nurse noticed the dressings were blood stained but could detect no active bleeding. On each dressing thereafter noticed the presence of blood. The matter being reported to me on my morning rounds upon inspecting the wound found a small bleeding vessel—just beneath the skin—which was everted and seeping actively at this time. A hemostat was applied with directions to be removed in three hours. At next dressing this was done there being no bleeding. During the following night the same intermittent bleeding reoccurred. The intern applied a forceps which was effectual for three hours. The same condition prevailed the next morning being the end of the second day after operation. With a fine needle and No. 00 soft gut I put a suture through the intercellular tissue around the bleeding vessel and tied it after which time we had no further trouble.

Have had trouble similar to this happen to me at least five or six times in my experience and do not understand why a small vessel should bleed so persistently, especially when the general condition of the patient is normal as regards bleeding and clotting time and why bleeding does not stop after vessel being crushed with hemostat and controlled by pressure.

I had recently a woman who bled from a perineal wound intermittently for two days condition easily being controlled by pressure and remaining so for short periods only to bleed again, and upon close investigation found similar condition as described in above patient.

This might be thought to be due to poor hemostasis but I think not as I am especially careful to see that field of operation is thoroughly dry before closing. If this were a general oozing

one might consider some bloody dyscrasia, but this case and the others that I allude to were distinctly individual vessels.

The beginning of the second day following operation general condition of patient was good. Temperature 100, pulse 85, belly soft and not distended. He was annoyed by an intermittent hiccough which lasted variable lengths of time, and vomited two or three times the second day. Had been taking small quantities of water when desired, since awakening from anesthesia. Hiccoughing and vomiting became more annoying the third day, temperature and pulse normal, abdomen flat, no gastric distention could be elicited, but vomiting persisted at rather long intervals, also the hiccough would annoy him occasionally.

The fourth day little or no change, hiccough and vomiting persisted, pulse and temperature normal, belly flat. Hoffman's anodyne and local irritation (mustard plaster) over upper abdomen, atropin, morphin, and a number of other devices resorted to with no relief, although the patient was not showing any serious effects from these troubles. Stomach lavage was resorted to several times, but this was objectionable to the patient and much resisted.

The fifth day, the same as before, using stomach lavage, also morphin and atropin hypodermically.

The sixth day the hiccough was not so annoying, only coming on occasionally, but the vomiting persisted, pulse and temperature remaining normal. Wound draining freely, no abdominal distention. Patient had been taking proctoclysis (tap water) by Murphy drop method, continuously, which he had retained well. This was discontinued at end of third day, and an enema given once a day, at which time flatus in small quantities was expelled, with very slight fecal results. This was repeated every morning for a number of days.

A Relfuss's tube was inserted into the stomach on the sixth day, and tube taped to the face to keep in position. It began immediately to drain slightly green-tinged fluid. Vomiting ceased. This tube was kept in place for the three following days, patient being permitted to take fluid, most of which would siphon back

through the tube but it took care of the vomiting and incidentally kept up a more or less continuous gastric lavage, as he drank quantities of water as well as permitted clear fluids such as coffee tea, grape juice, strained orange juice, and the like

From this time on patient made an uneventful recovery, the drainage wicks being gradually removed after the second day

There are three incidents in this case that I would like to call attention to



Fig 581 —Rehfluss s tube in position Attached to face with adhesive for continuous drainage of stomach

First, the persistent bleeding from a small, individual vessel, and when such occurs, immediate suture as above described, rather than to depend upon clamp or pressure

Second the use of Rehfluss s tube, which has served me well many times in this respect It can be used at any time when gastric lavage is indicated postoperatively, and is much more effectual for the drainage is continuous The patient can drink, and should do so, which is most gratifying to him and serves as

a gastric lavage. It should be left in long enough, for days if necessary. In the above case it was in three days before removal. If there is any uncertainty whether it should be removed or not, clamp it off to make certain, while tube is in position. Many patients who have gone through both gastric lavage and the retention of Rehfuss's tube, tell me they much prefer the latter. It is well to have a 20 c c syringe on hand in case the tube should stop drainage, as the caliber is small and mucus could easily clog it. This can be accomplished by suction, or injecting a syringe of water through the tube.

Third, use of large, hot, wet applications to all suppurative abdominal wounds. Use interrupted sutures in closing and put sutures far apart so drainage may be free between them.

APPENDICITIS CAUSING PARTIAL INTESTINAL OBSTRUCTION

F M , white, female, aged sixty six

Family and past history of no consequence except as below stated

On September 19, 1926 was very miserable and had severe pain in her right lower abdomen, which was cramp like, would come and go, and lasted about four hours Hot applications were made and patient rather severely burned, which took quite a while to heal, there was a deep seated tenderness which lasted a number of days She has been bothered with constipation for some time past, and has had to be very careful about not over eating Takes mild cathartics often to keep bowels open and soft, for if she did not she has gas pains Enemas gave her the most constant and regular relief for the so called gas pains

Again in January had rather a severe case of cramps and soreness in her right abdomen Was in bed three days and eventually relieved by hot stupes and enemas

On May 1st again began to have some colicky pains which would come and go Was up and down in bed, resorting to enemas and hot packs getting partial relief I saw her on May 12, 1927 at which time temperature was normal, leukocyte count 8160 Abdomen distended, but not sensitive except on the right side, under McBurney's area, and could elicit upon palpation an indistinct mass which was quite tender upon pressure A general rumbling and gurgling in the bowels could be elicited by the stethoscope over the abdomen There was no vomiting, although small quantities of gas were passed at intervals by bowel

The question of diagnosis raised in my mind was whether the condition was inflammatory, associated with the appendix, or a malignancy The history of previous attacks subsiding without other conditions and symptoms made me feel it was the former

level of navel which is well shown in Fig 583 The notch in the spleen could not be detected
 x Ray Examination No evidence of stone or tumor in kidney or bladder region
 Flat films of gall bladder region show no stones



Fig 584—Weight of spleen $4\frac{1}{2}$ pounds

Stomach and duodenum show normal outlines and empty in six hours
 Free HCl 12 Total acidity 24
 The barium enema showed no filling defect, but there is a reduplication of the descending colon
 Cystoscopy Left kidney injected and showed normal out

lines There is a shadow on the left side of the pelvis, which is a very short distance from the ureter

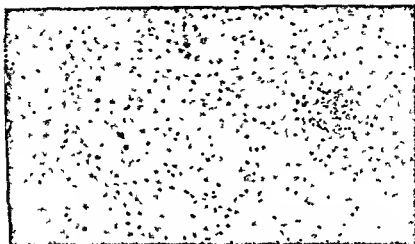


Fig 585 —Section of liver showing only mild degree of connective tissue increase

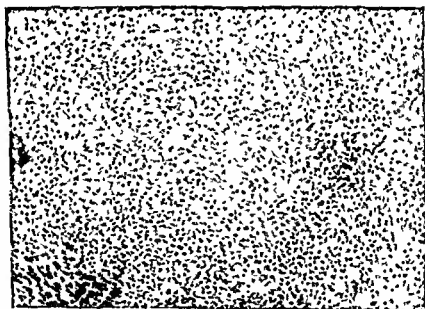


Fig 586 —Section of spleen showing almost complete replacement of malpighian bodies by a loose, fibrous tissue

Blood Examination, April 20, 1927. Erythrocytes, 5,770,000; basophils, 4 per cent ; hemoglobin, 35 per cent ; anisocytosis,

slight, leukocytes, 7300, neutrophils, 71 per cent, lymphocytes, 23 per cent, transitionals, 2 per cent, Kahn test, negative

On April 5, 1927, gave blood transfusion 520 c c by Scannell's method, and this was repeated May 5, 1927, at which time gave 500 c c, hemoglobin being 48 per cent before last transfusion

Blood Examination, May 12, 1927 White blood cells, 6200, red blood cells, 4,210,000, hemoglobin 70 per cent

Differential Polynuclears 80 per cent, small lymphocytes, 15 per cent, large mononuclears and transitionals, 3 per cent, basophils, 1 per cent, eosinophils, 1 per cent There is slight irregularity in size of red cells No irregularity in shape No nucleated red cells Marked achromia Coagulation time, four minutes, bleeding time, three minutes, platelets, 160,000

Fragility Test Hemolysis begins at 0.38 per cent sodium chloride Complete at 0.32 per cent

Splenectomy done May 23, 1927, hemoglobin just before operation 70 per cent Gas ether anesthesia Left paramedian incision, retracting the left rectus muscle to the left The liver was enlarged A slight amount of free fluid in the peritoneal cavity, also an accessory spleen about the size of a hazel nut attached to the mesocolon by a pedicle 1 inch in length, which was removed Examinations of the stomach gall bladder, and duodenum were negative Pelvic examination revealed absence of left tube and ovary, also appendix which had been removed at some previous operation done elsewhere Right ovary and tube apparently normal

A number of adhesions to the upper inner surface of spleen, attaching it intimately to the stomach were encountered These were ligated and divided Spleen was then delivered and large abdominal pack put in upper area under diaphragm to control seepage This procedure was devised by Dr Mayo a number of years ago in spleens adherent to diaphragm, when it is hard to control the bleeding This will take care of the condition until the spleen has been removed and better access can be had to that area Often the pressure of the pack alone will suffice to control the bleeding

There was a large anomalous vessel attached to the lower

inner border of the spleen, distinct from the main pedicle. Vessels were ligated doubly with twenty day chromic gut, using No. 2, as it is less liable to cut through the vein, which is sometimes quite friable. The stump was then covered with peritoneum, and the wound closed after removing a piece of liver for microscopic examination. Patient made an uneventful recovery, leaving the hospital on the 13th day.

On June 30, 1927. White blood count, 11,000, red, 4,300,000, hemoglobin, 78 per cent.

The disease is remarkably chronic, often lasting ten or more years and very often the only evidence is the enlarged spleen. The cause is unknown. The diagnosis is arrived at by the progressive enlargement of the spleen, anemia of a secondary type, leukopenia, and a marked tendency to hemorrhage. And late in the disease we have cirrhosis of the liver with ascites and slight jaundice, known as Banti's disease which we now know to be an advanced splenic anemia.

The blood picture as recorded in this case is quite characteristic, except the leukopenia is not as low as in most cases.

This patient has had no hemorrhages to her knowledge, which is characteristic of this disease. At times such hemorrhages are very profuse from stomach and bowel. On one occasion I had a man die from persistent hemorrhage with this disease. He was transfused three times, but to no effect.

Splenectomy done early frequently effects a complete cure. Mortality of the operation in these cases ranges from 9 to 19 per cent.

I believe it rather unlikely that a diagnosis can be made in the very incipency of this disease, and, too, one would not be justified in doing a splenectomy with the meager findings of the blood alone without some enlargement of the spleen. It is generally accepted that the spleen has to be about twice its normal size before it can be clinically recognized, the disease probably having to be in progress some time before being determined.

Unquestionably it would be the ideal procedure to do a splenectomy at the beginning of the disease, if it could be definitely determined.

Dr R F E Stier pathologist at St Luke's Hospital made an elaborate report on the gross and microscopic findings which space will not permit me to publish His conclusions were

- 1 Spleen—Chronic splenitis (Banti's disease)
- 2 Accessory Spleen—Chronic splenitis
- 3 Liver—Chronic hepatitis (mild)

CLINIC OF DR. REXWALD BROWN

COTTAGE HOSPITAL, SANTA BARBARA, CALIFORNIA

TORSION OF GREAT OMENTUM

THIS patient is eighty years of age. He was awakened last night by a sense of fulness in scrotum which gradually developed into a severe pain both in scrotum and in abdomen. The family physician, Dr. L. E. Heiges of Lompoc, was called who tried in vain to return the scrotal mass into abdomen. Patient was then sent to hospital.

Patient says he has not vomited since onset of trouble and bowels have not moved. He states that he was operated upon for right inguinal hernia in 1884, and that the condition recurred shortly after. He has worn a truss for many years, but it has not prevented many descents of a mass into the scrotum, which mass he has always been able to push back rather readily.

Examination reveals a very powerful, elderly man with a temperature of 100° F., and a pulse of 70. The leukocytes are 10,000, and the urine is normal. There is an enormous, tender mass in the right side of the scrotum, and great tenderness with rigidity in the right iliac fossa and over the symphysis pubis. An incarcerated hernia is diagnosed.

A right inguinal incision is made, extending into upper part of scrotum. On opening the canal a considerable amount of serosanguinous fluid escapes. The huge mass lying in the scrotum is seen to be omentum. This is gangrenous. It fills up numerous small and large pockets in the broad hernial sac, but is not adherent to the walls of the sac. We look for a constriction about the omentum by the internal ring, but find this does not exist. We find it easy to pull more gangrenous omentum through the internal ring, a surprising amount of it. Now, there comes into

view a twisted cord like structure, in caliber the size of the barrel of a fountain pen. We recognize this as a torsion, several times a twist of the omentum. There is no circulation below the torsion, thus accounting for the gangrene. We place a strong ligature through normal omentum just above the twisted pedicle, and excise the gangrenous mass below. We find the mass almost completely fills a large basin such as we use to rinse off our hands after scrubbing.

The large sac is now cut away, a polycystic testicle removed, and the usual inguinal repair made.¹

Torsion of the great omentum, though not rare is not seen often enough to cause most surgeons to bear it in mind when studying a case for diagnosis. It should be thought of in a case of inguinal and scrotal hernia which becomes irreducible after a period wherein the sac has been repeatedly emptied by the patient himself, a member of the family or by a physician. Most cases of torsion are associated with inguinal hernia, into the sacs of which the omenta have made repeated entrances and exits. It is not improbable that the many returns of the freely moving omenta to the abdomen have caused them to roll and twist into cords in which the circulation is finally strangulated leading to the symptoms.

It cannot be said there is any classic picture of the condition but a careful survey of a patient's history may enable the surgeon occasionally to make a diagnosis.

When a patient is operated upon early and the diseased portion of the omentum resected recovery may be expected.

¹ This patient left the hospital in three weeks completely recovered after an uneventful convalescence.

BACKWARD AND INWARD DISLOCATION OF STERNAL END OF CLAVICLE OPEN REDUCTION

This patient is twenty years of age Three days ago he was kicked by a mule the hoof striking him just outside the junction of the left clavicle with the manubrium There were no symptoms other than severe pain and inability to use arm adequately An x ray picture revealed a dislocation backward and inward of the sternal end of the clavicle Under ether it was impossible to dislodge or even budge the dislocation The sternal end of the clavicle was easily felt in the suprasternal notch Because of our inability to reduce the deformity by manipulation we are going to do an open operation

Our incision is 4 inches long beginning at upper end of manubrium and extended along clavicle The sternoclavicular ligament and interclavicular ligament are seen to be torn as well as the costoclavicular ligament The articular disk is lacerated We try to pry the clavicle out from behind the sternum This proves to be difficult With two very large long bone holding forceps held by assistants pulling outward on the clavicle and by manipulation and lifting with a blunt hook on the sternal end of the clavicle we are able to swing the clavicle upward and outward into position Because the integrity of the joint is largely destroyed we conclude that permanency of position will be assured only by wiring the clavicle to the manubrium This we do by a double silver wire Closure is now made and upper arm is bound to side by adhesive plaster¹

This is a rare type of injury probably the rarest of all the types of dislocation of the clavicle Most of the dislocations are at the acromial end Not over 10 per cent of all dislocations in the body are of the clavicle In the literature references to backward dislocation of the sternal end of the clavicle are few and far between There is no standard procedure for handling them

¹ Patient left hospital in seven weeks with clavicle solidly fixed to sternum and excellent use of arm

URETERAL STONE. REMOVAL BY COUNCILL EXTRACTOR

This patient is a strong vigorous individual, twenty-seven years of age. A year ago, in San Francisco, he had an attack of ureteral colic. A stone became impacted in the ureter, and twelve attempts were made to remove it by ureteral manipula-



Fig. 587.—Stone above Councill extractor

tion through the cystoscope. The attempts were not successful, and operation was advised but refused.

Patient has since been relatively well until three nights ago when there was another severe attack of right ureteral colic, requiring morphin to quiet it. He was sent into the hospital where the stone was localized by ureteral catheterization and x ray ex-

amination. The stone lies about 3 inches above the ureteral opening into the bladder.

This morning it is proposed to secure the stone by means of the stone extractor, devised by Dr W. A. Council of Baltimore and first reported by him in the June 19, 1926, number of the Journal of the American Medical Association

My associate, Dr. Irving Wills, will undertake the procedure. You will note that the instrument is a modification of the well-



Fig 588 —Stone locked in meshes of extractor and being extracted

known esophageal probang, and consists of a long, flexible cable at the business end of which is a basket of five strands of piano wire which can be opened to admit the stone by compression of the handle

Dr Wills passes first a cystoscope, and then inserts a ureteral catheter up to and above the stone. The ureter is anesthetized with a few cubic centimeters of 5 per cent. procain, and the

catheter plugged. A wait of five minutes is allowed for the anesthetic to take effect. Five cubic centimeters of sweet oil are now passed through the catheter for lubrication. The catheter is withdrawn.

• The portion of the ureter below the stone is now dilated with the metal olive of Buerger. Dr. Wills next passes the Councill Stone Extractor into the ureter to a position, which having been calculated by previous measurement, brings the basket opposite the calculus. A roentgenogram is now taken to check up on the relation of stone and extractor. The wires are opened forcing the stone into their meshes. Another roentgenogram shows the stone locked in the wires (Fig. 588).

Dr. Wills makes gentle traction on the cable, watching progress through the cystoscope. The extractor appears in the bladder, carrying the stone, and now both cystoscope and extractor with its stone are withdrawn from the bladder. The successful conclusion is dramatic.

CLINIC OF DR O F LAMSON

SWEDISH HOSPITAL, SEATTLE, WASHINGTON

JEJUNAL ULCER

This morning we have a case of unusual interest, because of the fact that the patient developed a jejunal ulcer many years after a primary gastro enterostomy. In order that you may understand this case fully, I will briefly present the history.

The patient, who was at that time twenty years of age, first came to me in November, 1916. He then complained of epigastric pains of cramp like character that commenced an hour or two after each meal, evidently when the stomach was empty. Food ease was quite definite. At that time he had only had trouble of this sort for about two weeks.

On examination it was found that he was slightly tender at McBurney's point. His symptoms and history indicated probable hyperacidity, and accordingly he was advised regarding his diet, and was given a mixture of bismuth, magnesia, and soda. Evidently this somewhat relieved him as we did not hear from him for over a year.

On January 27, 1918, I was called to see him, and found him in deep shock and suffering from excessive pain in the epigastrium. His abdomen was extremely rigid. A diagnosis of perforated duodenal ulcer was made, and he was at once sent to the hospital and operated. We found a perforated ulcer and about 2 quarts of greenish fluid in the abdominal cavity. This was removed and the perforated ulcer was sutured, but after suturing it seemed that the obstruction of the duodenum was nearly complete necessitating a gastro-enterostomy as well.

The patient made prompt and satisfactory recovery, and remained well for seven years. He then developed a gastric



blood transfusion. He responded well and promptly recovered, and left the hospital in a week.

His condition has gradually improved so that today his hemoglobin is 65 per cent, and red count 3,360,000. It is now three months since he had the severe hemorrhage.

We consider now that this patient is sufficiently improved to warrant the necessary radical operation to relieve him of his

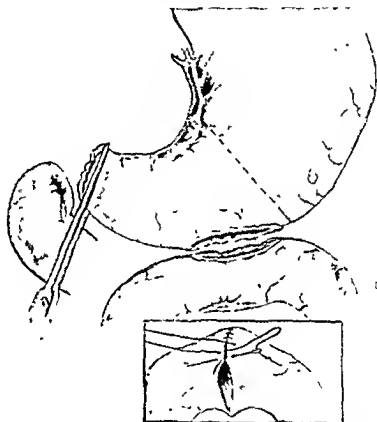


Fig 590 —Excision of ulcer and transverse suture of the jejunum

symptoms. While he might continue to improve, yet, owing to the fact that he had recently a severe hemorrhage, we feel that there is too great a danger of a recurrence of that complication.

We will make our incision at the site of the former operation through the right rectus. Exploration of the site of the duodenum reveals dense adhesions between the duodenum, liver, and gall-

bladder The gastrojejunostomy stoma is in good condition but opposite the site of the gastrojejunostomy on the mesenteric side of the jejunum there is an ulcer (Fig 589) On account of the severe hemorrhages he has had from this ulcer we feel that it is imperative that it be excised We will first undo the gastrojejunostomy and excise the ulcer then suture the jejunum transversely to prevent constriction at the sutured line (Fig 590)



Fig 591—Attaching end of the stomach to the side of the jejunum

We feel that we are justified in removing the pyloric end of the stomach in order to try to prevent the recurrence of his trouble Accordingly we will resect the lower third of the stomach the upper line of excision being just above the gastroenterostomy opening in the stomach We will close the duodenum with a double row of sutures and as the stomach can be brought through the mesocolon we will do a posterior Polya attaching the end of the stomach to the side of the jejunum (Fig 591)

The appendix shows dense adhesions about it and evidence of chronic inflammation We will therefore remove that also

DISCUSSION

The operation performed in this case, I believe, is best fitted to meet the conditions we found, as the dense adhesions about the duodenum make any plastic operation inadvisable. I do not favor the resection of a third or half of the stomach as a routine method in surgical treatment of duodenal ulcer, yet in properly selected cases of marginal or jejunal ulcers following gastro-enterostomy, I think this procedure is justifiable.

The necessity of a second operation in this case brings up the vital question as to whether a different type of operation in the first place would have made any difference in the permanency of the cure. A plastic operation with the excision of the duodenal ulcer undoubtedly does not change the anatomy as much as a gastro-enterostomy does, but I think we might naturally expect a certain percentage of recurrence of ulcer, no matter what type of operation is done. Thus far we can say that there is no operation which has been devised that eradicates the possibility of recurrence—in other words, we cannot expect 100 per cent. cure from any type of operation.

It is to be hoped that some time in the future, when our knowledge of the etiology of duodenal ulcer is more definite, and we know more of the factors which enter into its cause, better results will be secured either through medical or surgical treatment.

One thing we certainly know, and that is that there must be a hearty co-operation between the surgeon and internist, so that, on the one hand, there will not be too hasty operation until the patient has had a fair chance to be cured by medical treatment. On the other hand, the patient must not be treated too long medically.

CLINIC OF DR S L CALDBICK

EVERETT CLINIC, EVERETT, WASHINGTON

PROLONGED TREATMENT OF HYPERPLASTIC TOXIC GOITER WITH LUGOL'S SOLUTION, AND THE HANDLING OF SUPPOSEDLY INOPERABLE TOXIC GOITERS

In reporting the following cases, I do so for the purpose of emphasizing the danger of the prolonged use of Lugol's solution in the treatment of toxic goiter, and also to stress the importance of removing the entire thyroid gland in seemingly inoperable cases. Doctor Toland of Los Angeles advanced the theory, at the last meeting of the Pacific Coast Surgical Society, that Lugol's solution could be used over too long a period, and, in his estimation might do a great deal of harm. Doctor Gilman, of San Francisco also presented 23 goiter cases which were considered as heretofore inoperable in which he removed the entire gland with very gratifying results.

Case I—The first case I wish to report is that of Mr H, age forty years married and a clerk by occupation. Family history revealed that no other members of the family had suffered from goiter, and there was no known chronic disease in the family. Past history revealed ordinary diseases of childhood, but no other serious illness. At the age of twenty he lost an arm in an accident.

In the early part of 1924 he began to have slight enlargement of the thyroid gland, and a few months later developed heart symptoms, palpitation on exertion, and noticed that his hands were moist. In the course of a few months he became very weak, and suffered from extreme nervousness. These symptoms constantly grew worse until it became impossible for him to attend to

his work. His eyes became prominent and the thyroid gland became quite large. In the latter part of 1924 he consulted a physician who advised surgery. This he strenuously objected to and consulted another physician who gave him Lugol's solution. He was greatly improved by this treatment, gained in weight and strength and was so impressed with the glowing results that he continued to take Lugol's solution for a period of six months when his symptoms returned very much worse than they were originally. He was confined to his bed with very marked toxic symptoms. Exophthalmus was pronounced. The heart was at first very rapid and irregular—what some call transient and paroxysmal fibrillation. With the progress of the disease the cardiac damage grew more marked and a persistent fibrillation was the result. In March 1925 ligation was done under local anesthesia of the right superior pole. He was somewhat improved but in the course of six weeks began to grow gradually worse and with such marked auricular fibrillation that surgical interference was impossible. He died in September 1926.

Case II—Mrs. J., age forty seven years, a quarter blood Indian woman and a native of Washington. Family history revealed no chronic diseases. Past history showed ordinary diseases of childhood. She had typhoid fever at the age of eighteen and an attack of inflammatory rheumatism six years ago.

In the early part of 1923 she suffered from toxic goiter and was treated by a local physician for a few months during which time Lugol's solution was used with good results. In the early part of 1924 she underwent an operation in Seattle, a bilateral partial thyroidectomy being done, following which she was much improved. A year later the original symptoms recurred and under Lugol's solution she again improved. The Lugol's was continued for a period of eight months when she became markedly worse and was brought to our clinic for examination. We found her to be suffering from symptoms clinically typical of toxic goiter with marked auricular fibrillation. Basal metabolism was plus 65. The urine showed slight trace of albumin.

and occasional hyaline casts and the blood was negative in every respect. She was kept in bed in the hospital under medical care for a period of six weeks without any marked improvement. We considered her an inoperable case. The family was so advised and she was removed from the Everett Hospital and taken to her home where she died one month later.

Case III—Mrs. S., age fifty-two years, born in Wisconsin and lived in Washington for twenty-five years. She was the mother of three healthy children. Her work and social habits were negative and family history was negative. No tuberculosis or cancer and no history of thyroid disease in her immediate family.

In the early part of 1925 she was taken ill and consulted her physician who made a diagnosis of toxic hyperplastic goiter and put her to bed on Lugol's solution. She was so relieved of her symptoms that she refused operative treatment, continued the use of Lugol's solution for a period of six months when she became so ill that she was obliged to consult her physician again who put her to bed and administered Lugol's solution. This time she did not yield to Lugol's but gradually became worse and was brought to this clinic in December, 1925. She was admitted to the hospital and after careful examination it was found that great damage had been done to the heart muscle. There was marked persistent fibrillation and her metabolic rate ranged from 45 to 75 plus. She was seen by several competent internists who considered her condition grave and advised against surgery. This woman died in March, 1926.

Case IV—Mr. S., age fifty-five years, a native of Iowa who moved to Washington fourteen years ago, rancher by occupation.

Patient enjoyed excellent health and was a very hard worker. The family and past medical histories were negative. His usual weight was 160 pounds.

In the spring of 1926 patient suffered from duodenal ulcer. He was put on strict Sippy diet and with rest in bed for two months he made a good recovery. He regained his weight and

was doing his usual work on the farm. In October, 1926, he complained of being nervous, and at that time, he showed typical goiter symptoms. He lost weight rapidly and became so weak that he was unable to be about. In January, 1927, he was taken to the Everett General Hospital, where he was confined to bed and given Lugol's solution. He had lost so much weight, and was so extremely weak, with heart muscle so badly degenerated—as shown by paroxysmal attacks of auricular fibrillation—that it was not considered safe to do a thyroidectomy on this patient. Therefore, ligation was done under local anesthesia on January 20, 1927. Patient seemed somewhat relieved, but continued to lose weight. He returned to his home, and in the latter part of February he became very much worse. He re-entered the hospital where Lugol's solution was given and he was prepared for total thyroidectomy. On March 12, 1927, we proceeded to remove the gland. This was done by the usual method, but taking care to remove every particle of gland inside the capsule. After all the gland was removed the inside of the capsule was scraped with dry gauze, and the wound closed in the usual way. The operation was done as rapidly and carefully as possible, and much to our surprise the patient withstood the operation very well. From the first day his pulse became slower and he made a remarkable recovery. His weight at this time was 78 pounds. At the end of ten days he was gaining rapidly, and his pulse rate was almost normal. Small doses of Armour's thyroid gland were given. He has made a very remarkable and satisfactory recovery, and has now regained his usual weight, and regulates the dosage of thyroid according to his symptoms, taking from 1 to 3 grains daily.

Case V.—Mrs. R., thirty years old, married and has two children, four and seven years old. She came in for examination on May 8, 1927, complaining of weakness, nervousness, attacks of palpitation, and loss of weight. The family history was negative. The past medical history is negative, except for the ordinary diseases of childhood. There was nothing in her work, environment, or habits to account for the above symptoms.

The present trouble dates back about three years, at which time the chief discomforts were nervousness and rapid pulse. This particular feature continued so off and on for the year, when she consulted a physician who told her that her trouble was due to a hyperactive thyroid gland, which was at that time slightly enlarged. He recommended rest. After two months she was markedly improved, and was able to be up and about her home, and to do her own work. After a period of two or three months the foregoing symptoms returned, and she again went to bed and remained quiet for a period of six weeks, when she felt very much improved, and able to be up. She continued to be up and down for the next several months, when again the tachycardia was more or less persistent, whether she was quiet, or up and about. She continued to be up, did practically no work, but the nervousness and attacks of palpitation grew steadily worse. At night she was troubled with marked sweats, but complained of no chills, fever, or respiratory cough.

On May 8, 1927, she came in for examination and treatment. At this time she had the facies of the eyes common in exophthalmic goiter, with marked tremor of the extended hands. Her pulse was 150, but irregular in force. The thyroid gland was diffusely enlarged throughout. There was a definite bruit, but no definite thrill over the thyroid gland. Heart was not enlarged but rapid, regular in rate but irregular in force; no murmurs were made out at either apex or at the base. Lungs were negative throughout. The abdomen and genitalia were negative. Reflexes were all slightly increased, but equal. The general musculature of the body showed weakness in that she was unsteady in her gait. Blood findings showed hemoglobin of 78, with normal blood-picture. Blood Wassermann was negative. Urine reaction was negative. Basal metabolism was plus 52.

Her condition was such that surgical interference at that time was out of the question, so she was put to bed and given Lugol's solution in milk after meals and given a high-caloric diet. With this treatment, marked improvement was made as far as her nervousness was concerned, and the size of the thyroid was reduced, but it became much firmer than previously.

However the attacks of palpitation and the tachycardia persisted

It was the opinion after having observed this patient in the past several months that surgical interference at this time was justified. This conclusion was based on our past experience with similar cases in which we continued to treat them medically with the result that the patients established such heart muscle changes and general physical debility that a total thyroidectomy was impossible the patients going on to the usual grave ending

This patient was sent to the hospital and prepared for operation for complete thyroidectomy. This was done with very little disturbance of the heart rate and her convalescence was most gratifying. She left the hospital on the tenth day. Her pulse rate ranged from 72 to 84 and she felt very much rested. *The marked tremor of the hands was practically gone she had no night sweats and began to gain in weight.*

These few cases are reported to illustrate what can be done in seemingly inoperable goiters providing the entire gland is removed taking good care to keep within the capsule but removing all the thyroid gland and not disturbing the parathyroids. It has been said and I believe truly so that it is not the gland removal that gives the patients the symptoms following the operation but the portion of the gland that is allowed to remain. It is our impression that had the first three cases been operated doing a total thyroidectomy they might have been alive today.

After the thyroidectomy when the patients have regained their normal weight they are given from 3 to 5 grains of thyroid extract daily which keeps their physical condition perfectly normal.

CLINIC OF DR CHARLES T STURGEON

HOSPITAL OF THE GOOD SAMARITAN, LOS ANGELES, CALIFORNIA

AN UNUSUAL POSTOPERATIVE COMPLICATION IN EXOPHTHALMIC GOITER

PATIENT is a female aged forty five, and presents the following symptoms Marked weakness especially of the legs, nervousness tachycardia, tremor loss of weight marked exophthalmos, enlarged left lobe of the thyroid sweats and dyspnea

All the above symptoms were noticed twelve months ago, and have gradually increased in severity up to the present time The metabolic rate is plus 58 per cent

Eighteen years ago she had the same symptoms at which time nearly all of the right lobe of the thyroid was removed—the left lobe was not enlarged at the time Following the operation she was relieved of all her symptoms for seventeen years

Physical condition shows a very poorly nourished, extremely nervous woman The left lobe of the thyroid is enlarged about three times greater than normal no nodules are felt Right lobe is not palpable Pulse rate is 140 Blood pressure, 140/80 Laryngoscopic examination is negative no lagging of vocal cords

Patient was hospitalized for two weeks, given 10 minims of Lugol's solution three times a day later increased to 15 minims three times a day She did not respond well to the Lugol's solution probably due to the fact that she had had iodine medication periodically during the last year

Operation—Under ethylene anesthesia about seven-eighths of the left lobe was removed It was noticed that the trachea had been displaced to the right of midline due to adhesions from

the previous operation. The adhesions were not disturbed. The patient stood the operation very well, the pulse was 104 at the end of the operation.

Postoperative Course—Immediately upon awakening, while still in the operating room, she complained of difficult breathing. Thinking the dressing might be too tight, it was loosened, but this did not give relief. Morphine, $\frac{1}{4}$ gr., was given, which gave her relief for about three hours. The dyspnea again recurred, being entirely inspiratory in character. A laryngoscopic examination was made and the cords were functioning normally, also there had been no change in the voice. The wound was inspected for hemorrhage. No bleeding or blood clot was found. In spite of all the ordinary procedures such as morphine, $\frac{1}{4}$ gr., sodium bromide, 30 gr., and chloral hydrate, 15 gr., per rectum, fluids subcutaneously, 1 dram of Lugol's solution in a quart of water as rectal drip and steam inhalations of tincture of benzoin she continued to get more dyspneic and very tired.

It was then decided to do a tracheotomy, which was done through the same operative wound, a little 1 per cent novocain was used. The trachea was found to the right of midline, somewhat flattened, and buried by adhesions of the right prethyroid muscles. A small tracheotomy tube was inserted which gave almost immediate relief. The tube was kept in the trachea for four days then removed. She had a rather severe hyperthyroid reaction, lasting seventy-two hours, after which she made an uneventful recovery.

Comment—The usual postoperative causes of dyspnea are

- 1 Injury to the recurrent laryngeal nerve
- 2 Tracheal collapse in the large adenomatous goiter, especially the intrathoracic type
- 3 Occasionally, at the height of a severe postoperative reaction

In this case the goiter was small, about the size of a hen's egg, but on account of tracheal deformity due to adhesions, the relieving of pressure by the removal of the left lobe probably caused a kink, sufficient to produce the dyspnea.

The reason for leaving the tube in the trachea for four days was the severe postoperative hyperthyroid reaction and I did not feel it safe to remove the tube earlier.

It is now four months since her operation and her condition is excellent, no difficulty in breathing and she entirely relieved of her hyperthyroid symptoms.

enlarged. The blood showed Hemoglobin, 92 per cent (Sahli), red blood cells 4,480,000, leukocytes 11,000, polymorphonuclear leukocytes 72 per cent. The urine 1 plus of albumin few hyalin casts leukocytes, and red blood cells. The x ray examination showed the right kidney normal as to size, shape, and position. The hepatic flexure was displaced upward above the large globular mass which occupied the right iliac fossa and extended upward to the level of the transverse process of the third lumbar vertebra.

Diagnosis—The possibility of a kidney tumor, a polycystic kidney, or hydronephrosis in view of the urinary frequency complaints and laboratory findings was carefully excluded by an x ray shadow of a normal right kidney. Malignancy, especially sarcomatous in a tumor of this size is usually firmer and painful, showing more anemia than seen here and with evidences of involvement elsewhere as metastases. Carcinomata of the peritoneum are more irregular and firm with more general constitutional signs of a malignancy. In mesenteric cysts we find generally a more movable mass of smaller size and of a cystic nature on palpation. The mass is not painful and there is no leukocytosis or temperature as found in an abscess. Pancreatic tumors are more nodular irregular and firmer than this mass, if cysts they are generally smaller and often occupy the mid position. A diagnosis of *retroperitoneal growth of an unknown origin or type* in lower abdominal or pelvic region was made and operation advised.

Under ethylene gas the abdomen was opened by an outer low right rectus incision over the most prominent part of the tumor, opening into the peritoneal cavity. A large retroperitoneal tumor was observed in the right iliac fossa pushing the cecum to the midline. An incision was made through the peritoneum over the presenting tumor, and a huge lobulated fatty tumor enucleated from above downward. The pelvic or dependent part of the tumor was found to have protruded through a dilated right femoral ring. The rent in the peritoneum and the abdominal cavity closed in the usual way without drainage.

The site of origin is most interesting and unusual, starting

in the thigh and forcing up through the femoral canal space retroperitoneally into the abdominal cavity

Convalescence was without event. The distress of urinary frequency rapidly diminished to normal and the bowels became more regular. Ten days following operation he was allowed to go home.

Grossly the specimen showed an encapsulated tumor-mass, of uniform consistency, lobulated, and measuring 8 x 3.5 x 5.5 inches. On section the specimen showed a benign lipoma, but it is not unusual to find these large, fatty tumors showing a malignancy.

CLINIC OF DR. ANDREW STEWART LOBINGIER

GOOD SAMARITAN HOSPITAL, LOS ANGELES, CALIFORNIA

OMENTAL ADHESIONS AT THE HEPATIC FLEXURE AND GALL-BLADDER

IN interpreting the pathology of these obstructive adhesions it is necessary to consider the part taken by the colon and liver in the inflammatory changes which produce them.

The primary focus of infection is probably the appendix in most instances. But either through the lymph channels or the portal circulation, bacteria find lodgment in the subserous reticular area at the flexure, and in the perilobular areas in the liver. This inflammation, reaching the serous covering of these organs, causes the omentum to adhere, producing kinking and twisting of the colon, and interfering with the colonic current. The hepatitis in the liver resulting from this infection causes, by lymphogenous extension, cholecystitis and in some instances pancreatitis.

Adhesions of the gastrohepatic and great omentum to the gall-bladder and border of the liver are frequently seen, the gall-bladder being partially or wholly covered, or distorted, and drawn out of its normal position. In two cases the adhesion of the great omentum extended along the entire right border of the liver, covering the gall-bladder, and dragging the hepatic flexure and first third of the transverse colon far out of their zones. The gall-bladder may be contracted and hyperplastic, and especially thickened if the infective edema in the liver has persisted after the initial hepatitis.

As a rule, these adhesions carry in their train a complex of symptoms which are attended with pain or a feeling of distention after eating and visceral disfunction. One of the most con-

stant symptoms is pain in the region of the hepatic flexure a more or less constant tympany, and associated with it, constipation and the colicky pains of mucous colitis. If the pylorus is constricted or drawn out of place by the adhesions, nausea, and symptoms of pylorospasm and pyloric obstruction may be present. Anorexia and a general bodily languor are not uncommon.

The diagnosis may be made by a carefully taken history and the general symptoms, which are characteristic and easily interpreted by one familiar with this specific pathology. Radiographic studies are useful in the region of the flexure but may be and usually are misleading in the region of the gall bladder and pylorus. We usually disregard them.

The descending colon is very commonly spastic and mucous colitis is often present where the flexure is seriously deformed. Bile is found in the urine in those cases in which the choledochus or the common hepatic duct may be partially obstructed by kinking. The skin in these patients takes on a mildly tawny color not unlike that in hemolytic jaundice. Many patients show an increased leukocytosis and a decrease in red cells and in the color index. The treatment is frankly surgical. Most of the patients seen have gone through long courses of medical and dietetic treatment usually with benefit. But in time all of them relapsed. The long and expensive sanitarium treatment of these patients with ultimate failure to relieve them of their uncomfortable symptoms, eventually discourages them, and they turn to the surgeon whom they should have consulted in the beginning for definite relief. If the internist would make it a rule to be present and see the complicated pathology revealed in these patients at operation, he would cease to attempt longer to treat such organic visceral deformities until after they had been corrected surgically. It is folly to treat digestive symptoms and colitis medically in the presence of the adhesions we are considering. The internist should learn to diagnose these conditions as the surgeon has been compelled to do, and he should be afforded the opportunity to study the living pathology and rely less on laboratory tests which so often mislead him.

In freeing the adhesions and restoring the viscera to their normal position the finest surgical technic should be employed to conserve the delicate omental tissue and cover in all raw surfaces. If the liver is edematous or the pancreas is enlarged the fundus of the gall bladder should be removed and the liver and pancreas drained through the cystic duct. In all cases the appendix should be removed as a routine.

It is surprising what the internist can do for these patients *after* the appropriate surgery has been done.

The resumption of gastro intestinal normal function is rapid and substantially permanent and only in the smallest percentage is there even in slight degree a reforming of the adhesions if the work has been properly done.

In the twenty years in which our attention has been critically directed to the colon and gall bladder we have seen an increasing number of these cases and obviously because we make it a routine to examine the regions which may be involved while engaged in the consideration of other abdominal conditions.

We cannot too often emphasize the surgical stupidity of removing a chronically diseased appendix without inquiring into the pathology of the colon flexure the liver gall bladder and pancreas. And this inquiry should be more than a hasty and casual inspection it should be guided by evidences lower down of lymphatic extension higher up and by an intelligent understanding of the possible pathology one might reasonably expect to uncover.

CLINIC OF DR HAROLD BRUNN

SURGICAL CLINIC AT THE SAN FRANCISCO HOSPITAL, UNIVERSITY
OF CALIFORNIA SERVICE

CARDIOSPASM

THE patient that we have to present this morning is a man who was referred to us by Dr John P Sandholdt of Monterey

He presented a very advanced type of the disease generally known by the term "cardiospasm" We operated upon him at the University of California Hospital on January 26 1927 He comes back to us to report on his condition and for further x-ray studies The operation has completely relieved him so far as the symptoms are concerned, and he is able to eat all kinds of food with comfort and without regurgitation, gaining at least 30 pounds in weight

This condition which is generally described under the term of "cardiospasm" has been known for a good many years—articles upon it having been written as early as the seventeenth century We find reports by Purton in 1821, Hannay in 1833, and, in 1874, von Ziemssen and Zenker collected 17 cases and added one of their own In 1881, Mikulicz and Strumpel described the condition, and after making a careful study of its origin gave it the name of "cardiospasm," believing that the condition was caused by spasm of the cardiac end of the stomach This name is a very poor one Many others have been advanced to improve upon it, but none has been acceptable, because no certain theory has been accepted in explanation of the condition So the term persists for want of a better one

At the present time, from our x-ray studies, we are certain that the obstruction does not occur at the cardiac end of the stomach, and that spasm is not a necessary part of the disease The term

cardiospasm is also sometimes applied to certain reflex spasms of the lower end of the esophagus occurring especially in nervous individuals and having their origin perhaps, in disease of the gall bladder or other intra abdominal organs. Under fluoroscopic examination there may be a spasm noted with delay at the lower end of the esophagus and with slight dilatation but one finds on second or third examinations that the spasm is absent and tends to come and go. These cases therefore should not be classified in this group. We believe that cardiospasm should be applied only to those cases where there is dilatation of the esophagus above the point of stricture which is persistent gradually increases with the lapse of time and always is a progressive disease. The patient presented today is a good example of this. You will notice also that he gives every appearance of having a very stable nervous system which is commonly so in cases of true cardiospasm in contradistinction to the instability of the reflex type.

The underlying causes which bring about cardiospasm are still unknown. Innumerable theories have been advanced none of which have any very exact basis either on clinical or experimental facts. Among some of the theories presented we may mention the idiopathic factor similar to that found in Hirschsprung's disease of the large bowel inco-ordination between the diaphragm and deglutition due to congenital abnormality, kinking of the esophagus at the hiatus inco-ordinated muscular movements lesions of the vagi nerves diaphragmatic pinch cock effect and double twist produced in the esophagus due to lung tips pressure. We can only say that there seems to be a neuromuscular inco-ordination with probably a congenital predisposition in explanation of this most peculiar and interesting disease.

The symptoms of this condition are fairly typical as they were in the patient we have before us. Dysphagia is the first complaint. It varies considerably from a vague sensation of discomfort to actual difficulty.

We are of the belief that the esophageal condition is usually congenital in origin but that the symptoms are overlooked during early life or may not be present comparable to the presence

of a cervical rib which fails to produce symptoms until the second or third decade. In cardiospasm, also, the symptoms usually arise in the third decade. Perhaps with age there is a further depression of the diaphragm or dragging on the esophagus with rotation of the tube that brings on the symptoms at this time. The dysphagia not infrequently comes on abruptly, and for that reason the patient thinks it is brought about by some indiscretion of diet, an injury, or following a severe illness. The incidence of the disease is about four males to three females.



Fig 596—Case V B January 10, 1927 Showing tremendously dilated esophagus, filled with bismuth lying to the right of the spine above the diaphragm. The constriction is several inches long before the cardiac end of the stomach is reached. The narrowing begins just at the entrance of the esophagus through the diaphragm.

Along with dysphagia the patient begins to regurgitate. This symptom may be early, at other times coming late. Pain is not usually a marked symptom except as it may be caused by the pressure of the dilated tube, but distress in the chest is often complained of. As the disease progresses and the taking of food becomes more and more impossible, the patient loses weight and strength dependent entirely upon the degree of obstruction.

The dilatation of the esophagus progresses from a spindle enlargement to a very large cylindrical or fusiform sac with marked elongation. We draw your attention to the x ray plate of this patient (Fig 596) which shows an enormous enlargement of the esophagus above the diaphragm. It is quite as large as the ordinary stomach and when we saw it first under the fluoroscope, we felt sure that we were looking at a diaphragmatic hernia, in which the stomach was above the diaphragm. It will be noted



Fig 597 —Case V B July 25 1927 After operation manual dilatation (Mikulicz) The esophagus still dilated but diminished in size. The opening through the diaphragm considerably enlarged permitting the passage of all kinds of food

also that the bismuth trickles somewhat eccentrically, through the diaphragm as a narrow stream for several inches before reaching the cardiac end of the stomach. The elongation of the esophagus is shown by the fact that it now lies to the right of the spinal column, and the smoothness of the entire tube is especially to be remarked.

In the early stage diagnosis may be difficult. It is best made by an x ray examination with a thick barium paste. Esopha-

gосcopy will usually at this time show very little. In the later stages, both esophagoscopy and especially the x-ray give very definite information. It is advisable to wash out the sac with a stomach-tube before examinations are made. The most important differential diagnosis is the distinction between the carcinoma of the esophagus and cardiospasm. In Fig 598 we have a lateral



Fig 598 —Carcinoma of the esophagus. Typical picture of a lateral view of the esophagus, showing irregularity at the point of stricture, the barium meal trickling down the middle as a small narrow stream, and with very moderate dilatation of the esophagus above.

view of a carcinoma of the esophagus, showing the moderate dilatation above a very tight stricture and some irregularity of the wall of the esophagus at the lower end. In Fig 599 we have a different type of carcinoma, coming on the basis of a polypoid condition, in which you see dilatation and constriction in different areas with the polypoid mass outlined by the barium meal.

I want here again to stress the very important symptom of dysphagia. This symptom is an early one both in cardiospasm and carcinoma of the esophagus, and immediate steps should be taken as early as possible to differentiate them. This symptom may disappear and recur again after weeks or months. Its occurrence warrants an immediate examination of the esophagus



Fig. 599.—Stricture and dilatation of the esophagus from a polypoid growth, which has become catenomatous in certain areas.

with the esophagoscope. It is only by this means that carcinoma of the esophagus can be diagnosed early enough to admit surgical interference. x Ray examinations at this stage are usually negative. If the disease however is cardiospasm the mistaken diagnosis does not lead to such serious consequences. The condition will merely progress to a further stage and can be handled

later. There are other conditions of the esophagus such as polypi, strictures, ulcers, and pressure upon the esophagus by mediastinal tumors—all of which may have to be differentiated.

The treatment of this condition is now almost entirely by dilatation with the Plummer dilators. Nearly all cases can be relieved by gradual dilatation. The dilator has a rubber bag on the end, and its passage through the small narrow opening of the diaphragm is facilitated by first having the patient swallow a piece of thread. Sufficient time must elapse for the thread to enter the stomach and intestinal tract, the end hanging from the mouth is then threaded upon the instrument, and as the thread is pulled taut it is guided through the opening. Gradual hydrostatic pressure is used to enlarge the esophageal constriction.

Plummer, at the Mayo Clinic, has treated well over 500 cases by this method with very excellent results. Surgery in various forms has been used such as plastics on the esophagus, but the best surgical method seems to be that recommended by Mikulicz in 1882, and later by Walton, who reported 16 cases in the *British Journal of Surgery* in April, 1925. This is the method by digital dilatation through the stomach.

All methods that are used, both the non-operative and the operative, carry with them one great danger. If the wall of the esophagus is punctured, mediastinitis is easily set up and death from infection is liable to result, so that all manipulations either with the bougie or fingers must be done with extreme care. In the case which we have before us we failed to find the opening with the esophagoscope because of the huge dilatation, and fearing a puncture of the thin-walled esophagus we decided to carry out the method of Mikulicz by digital dilatation.

ILLUSTRATIVE CASE

The patient whom we have seen presented the following history.

V. B., Case No. 37490-S. Patient first consulted us at our office, and was later sent to the University of California Hospital for further study.

Age.—Forty-eight years.

with the idea of passing a Plummer bag later and dilating the lower end of the esophagus. The patient was unmanageable under local anesthesia so the procedure was carried out with a general anesthetic. Following is the report of Dr. Martin.

The string although in position forty eight hours has failed to go through. The sac is about 8 cm. in diameter with many trabeculations showing. The opening at 46 cm. is at the right angle of the sac and sharply angulated to the left. A small dilator with flexible tip was passed without difficulty. I do not believe a Plummer dilator can ever be successfully passed due to the sharp angle the neck of the sac takes.

Operative Procedure —As a preliminary the esophageal sac was washed out thoroughly with salt solution the night before and again the morning of operation in order to remove any food and debris which might be lodged in the sac. If this is not done the field of operation may be infected by a sudden gush of fluid from above during the operation. Under general anesthesia a midline incision was made between the ensiform cartilage and the umbilicus. The stomach was readily exposed and a transverse incision made in an avascular part of the anterior wall running up well on the cardiac end. The contents of the stomach were then removed by suction and the abdominal cavity carefully walled off by moist tapes. With the field thus protected the whole hand was inserted into the stomach up toward the diaphragm and the index finger groped for the opening of the esophagus. In this case it was found well toward the right. The opening was not easy to find as it seemed to be covered by a reduplication of mucous membrane which acted like a veil over the orifice.

The point of obstruction and narrowing was at the point where the esophagus passed through the diaphragm. The index finger passed into the opening with only slight difficulty. When we attempted to pass two fingers however a sharp band like resistance was felt almost like a cutting edge so that we proceeded with the dilatation very slowly. Finally both the index and middle fingers could be passed through the opening. The fingers were then separated to enlarge it. The little finger was

then added so that a four finger dilatation was obtained. Walton states that this is necessary for a permanent result. Plenty of time was taken to permit the dilatation to occur without tear or rupture of the esophagus, and it would seem that only by the use of the fingers and the sense of touch can this be carried out with safety. As has been pointed out, the use of an instrument is fraught with danger.

The opening of the stomach was then closed by two layers of sutures, and the wound closed in the usual way without drainage.

The patient was allowed to swallow water after the first twenty four hours, and gradually resumed the taking of soft food. His convalescence was uninterrupted, and he was discharged on February 15, 1927, at which time he was able to take almost any kind of food without discomfort or distress.

At the present time the patient has gained about 30 pounds in weight, is very happy, and has no difficulty in swallowing.

x Rays taken July 25, 1927 (See Fig. 597), show there is still considerable dilatation of the esophagus above the diaphragm, but nothing like that found in his original plate. This will persist probably over a period of several years. The narrowing of the esophagus through the hiatus of the diaphragm is seen, but it is much wider than before operation, as shown in Fig. 596.

CLINIC OF DR RICHARD B DILLEHUNT

EMANUEL HOSPITAL, PORTLAND, OREGON

ORTHOPEDIC CLINIC

CASE I LUXATION OF THE ACROMIOCLAVICULAR JOINT

THERE is no injury about the shoulder joint, that I know of that seems so unimportant when it is inflicted, but becomes so disabling when inadequately treated, as dislocation of the acromioclavicular joint. Most of the instances of this injury that we have seen have been old long standing disabilities in which the patient usually a workman, says that he can do very little or no work because of insecurity of the shoulder. In elevating the upper extremity, especially in moderate abduction, when any stress is placed upon it, as in lifting "something gives way, and the arm "becomes weak," and the shoulder is unstable and difficult to control. There is no doubt about the reality of this complaint, and examination reveals the prominent upward projecting outer end of the clavicle with hypermobility of the acromioclavicular joint. Our treatment in these cases has been operative exposure of the joint, removal of all intervening cartilage and soft tissue between the clavicle and acromion process, and arthrodesis by bone scarification and bone chips and flaps followed by prolonged immobilization, yielding fairly good results.

There are two reasons for the commonly prolonged disability in this injury. First, the nature of the injury is often overlooked altogether, and therefore, is not treated at all, and second when it is recognized it is seldom adequately treated. As in any other luxation, the treatment consists of complete reduction and retention therein, until torn periarticular ligaments have

healed, and subsequent protection against their tearing again either suddenly or gradually

This injury, usually so disabling, responds readily to such treatment

This patient fell, resisting, as usual the fall with the hand, resulting in an acutely painful left shoulder, with moderate swelling about the acromioclavicular joint. When the weight of the arm is allowed to hang at the side the pain is increased inclining the patient to hold the weight up with the other hand. The outer extremity of the clavicle juts upward more than nor-



Fig. 600—Radiograph of dislocated acromioclavicular joint

mally, and when the left arm is lifted passively by the examiner the acromion can be lifted up and the clavicle pressed down into normal position; there is hypermobility. These findings, together with localized tenderness over the joint, constitute the diagnostic features of the injury, and are more important than the x-ray findings. The radiograph may be misleading in acromioclavicular joint injuries for two reasons. One is because, in some persons, the normal joint has a wide interarticular interval between the bone-ends, which looks like a separation, especially when the clavicle is on a higher level than the acromion which sometimes obtains normally. The other source of error

lies in radiographs taken with the patient reclining and holding the dislocated joint in a position that yields a view, giving the appearance of a normal joint.

In this case the radiograph (Fig. 600) shows definite separation.

When the luxation occurs, there is undoubtedly extensive tearing of the capsular ligament of the joint, and someone has



Fig. 601 —Arm and trunk incased in plaster

recently demonstrated that the coracoclavicular ligament is similarly damaged, and the latter has been suggested as the chief pathology

In any event the treatment of the early case demands complete and prolonged reduction. Reduction can be brought about in only one way, viz, elevation of the entire weight of the upper

extremity well above its normal level which lifts with it the scapula and hence its acromion process. This is simple enough but the problem is how to keep it there. The commonly used and occasionally successful method is to lift the weight of the arm by means of sling or adhesive tape passing around beneath the elbow and crossing over the outer half of the clavicle in other words slinging the weight of the arm over the clavicle



F g 602 —Jacket and arm plaster connected with arm elevated

pulling the former upward and the latter downward. The degree of pressure required to retain reduction by this method for the requisite time has been in my experience too much to be borne by the skin and the patient even when applied most meticulously. Moreover it is desirable to maintain complete control and this method provides only partial control. The only method which enables complete control of injuries to the acromioclavicular joint and in fact to the clavicle and sternoclavicular

joint is one which embraces all elements entering into movements thereof, viz, the entire trunk, and the entire upper extremity

We have applied such a method in this case. A well fitting plaster jacket is applied and the whole upper extremity is enclosed in plaster (Fig 601). This having been done, the arm can be placed in such relation to the trunk as to restore anatomic



Fig 603—Same as Fig 602

disarrangements of the shoulder girdle and then fixed there by connecting arm and trunk by a few turns of plaster bandage

In this case complete elevation of the arm with the extremity adducted and moderately rotated internally—the most comfortable position—accomplished complete reduction (Figs 602–604). The clinical appearance is borne out by the radiograph (Fig 605)

The plaster will be kept in position for six weeks, when it



Fig 604 —Same as Figs 602 603



Fig 605 —Radiograph of acromioclavicular dislocation after reduction

will be removed, and a sling provided, while strength is being regained by gentle and gradually increasing active movements.

The method is most gratifying in oblique fractures of the clavicle, in which retention by end-to-end apposition cannot be secured. In this instance the arm is fixed to the trunk in a position of extreme elevation, external rotation, and backward displacement.

Despite the numerous contrivances for the purpose, none actually completely controls the situation, except one based upon the principles that are applied in this case.

CASE II. PIROGOFF AMPUTATION: ITS ADVANTAGES OVER THE USUAL AMPUTATION IN THE LOWER ONE-THIRD OF THE LEG

This patient sustained a severe crushing injury of the left foot several years ago, which necessitated amputation through the mediotarsal joints as an initial procedure. Although experience leads us to believe that no amputation through the foot at the classical sites of Lisfranc and Chopart ever results in a painless and useful stump, it is, nevertheless, desirable in the early treatment of crushing injuries of the tarsus and metatarsus, in which the anterior foot obviously cannot be saved, to make the primary amputation through the midtarsal region. The reason for this is that infection is very liable to occur, and it is better to deal with it at the lower level than to risk it at the site of definitive operation, because the cicatrization incidental to infection in amputation stumps so often results in painful scars.

The patient had had the amputation through Chopart's joint with the usual disability—pain and difficulty in walking, owing to persistent plantar flexion of the foot, causing the anterior extremity of the stump to dig into the sole of the shoe. These patients attempt to gain relief by walking on the heel, and this is impossible because the strong Achilles group of muscles overcomes the enfeebled dorsiflexors producing equinus. For some reason, the extensors of the toes seem to lose much of their power of dorsiflexing the foot when their insertions are disturbed, even though the tendons are carefully reinserted into the tarsus.

In three of such cases we have performed the Pirogoff ampu-

tation, with most gratifying results. In all three, it might be mentioned amputation through the lower one third of the leg had been advised by artificial limb makers and others.

The operation is simple. An incision across the dorsum of the foot, from one malleolus to the other, exposes the ankle joint, which is disarticulated. The astragalus and all bony structures anterior to it, are removed, leaving only the lower ends of the tibia and fibula and the os calcis. The bones of the leg are sawed off just above the articular cartilage and the os calcis is sawed through at right angles to its long axis just posterior to its articular facet (Fig. 606). The sawed surface of the latter is



Fig. 606 —Indicates sites of section of bones of leg and os calcis

then implanted upon that of the tibia and fibula. In so doing the Achilles' tendon becomes taut and if too much so must be tenotomized. The ends of the incision are then joined by an other across the sole. The extensor tendons are inserted with chromic catgut into the subcutaneous tissue of the os calcis anteriorly and the wound closed. If there is no obvious inclination to displacement of the os calcis no pegs are necessary, and a well fitting plaster is applied as high as the mid thigh. The latter is removed in three weeks and a new one, very snug is applied up to the knee, and weight bearing thereon gradually permitted.

The resulting stump is exceptionally useful. It has the great advantage over higher amputation, in that the patient can walk

without crutches when not wearing artificial appliance; there is very little shortening; atrophy of the leg musculature is only



Fig 607.—Radiograph of Pirogoff stump



Fig 608 —Pirogoff stump.

moderate, simple prosthesis can be applied, and stability is much enhanced by weight-bearing on his own leg rather than indirectly through an artificial limb

In this instance the os calcis is united solidly to the tibia



Fig 609—Same as Fig 608



Fig 610—Prosthesis for Pirogoff stump



Fig 611 —Same as Fig 610



Fig 612 —Apparatus applied to Pirogoff stump

attached triceps muscle, and reflected upward. A chisel was driven through the site of the joint, and the bone ends were remodeled in the form of a trochlear joint. A flap of fascia lata was sewed over the remodeled bone-ends and the wounds closed.

The usual after treatment—early active and gentle passive movement—was carried out, with the net result after eight months of movement from flexion of 90 degrees to extension of 150 degrees. No amount of physiotherapy could accomplish any increase in the range of movement and the result was not con-



Fig. 615 —Voluntary extension after arthroplasty

sidered satisfactory in the light of the possibilities of arthroplasty of the elbow joint.

The reason for failure lay in inadequate removal of bone—a common source of error in arthroplasty. At the time of operation the newly constructed joint fitted snugly. It should have fitted loosely. Moreover, the modeled olecranon did not unite with the ulna, and constituted a source of annoyance and obstruction (Fig. 614).

The operation was repeated this time removing a very generous amount of bone from the articular ends so that they



Fig 616 —Voluntary flexion after arthroplasty



Fig 617 —Radiograph after second arthroplasty

articulated loosely The olecranon was removed altogether and the triceps attached to the soft structures about the ulna

The final result in this case is as good as can be expected in any joint reconstruction Complete flexion can be accomplished and extension is carried out to 180 degrees Pronation and supination lack only a few degrees of normal The joint is stable and the arm strong and useful (Figs 615 616) The radiographic appearance today is shown in Fig 617

Perhaps the commonest cause of disappointment in arthroplasty is injudicious selection of cases suitable for the operation To gain movement at the sacrifice of stability is a poor trade in the weight bearing joints When the musculature about a joint is greatly impaired either by cicatrization or destruction or nerve lesion increased joint movement means increased disability Considering the possibility of technical failure and the risk incidental to operation it is doubtful if arthroplasty is justifiable in ankylosis of one hip or one knee if fixed in the position of maximum usefulness

Of the actual operative technical errors I suspect the one here recorded is the commonest Barring the calamity of infection failure to regain a useful range of movement in the elbow joint is much less excusable than in the weight bearing joints

CLINIC OF DR. GEORGE W. SWIFT

KING COUNTY HOSPITAL, SEATTLE, WASHINGTON

MENINGIOMA OF THE LEFT FRONTOPARIETAL OF UNUSUAL SYMPTOMS. OPERATION. RECOVERY

THIS patient, B. B. W., is a male, sixty-four years of age, who was referred to me by Dr. Burdon, in March, 1926.

A year before that time the patient had noticed a little nodule on the left forehead, just external to the midline, which he considered a cyst. He consulted Dr. Burdon when he was con-

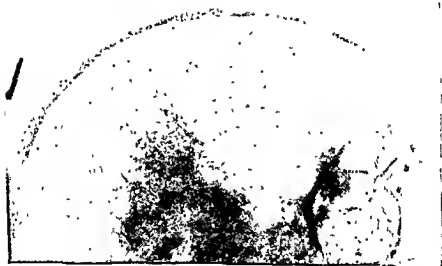


Fig. 618 —Roentgenogram taken in March, 1926, showing skull defect.

vinced that it was enlarging in size, and upon examination she felt pulsation of the cyst, and referred the case to me.

An x-ray was taken at the time (Fig. 618), which showed a small area just to the left of the midline and below the vertex, where the bone was eroded. A definite shadow of the vessel,

leading from below upward and from the front back toward this area suggested the possibility of this being a pericranial sinus with dilatation of the vessel on the outside of the cranium. The patient stated at that time that he had had no pain over the site nor had he suffered any headache. The examination of the eyes was negative and the blood test gave a negative Wassermann. The patient would not submit to an operation at that time and was not seen again until March 12 1927 when he reported to me and a second x ray was taken (Fig 619). This showed the extent and enlargement of the defect in the cranium.



Fig 619—Roentgenogram taken one year later showing enlargement of bony defect

He still had neither pain nor tenderness nor headache. The eyes were normal and there were no positive neurologic findings.

The mass however had increased to such size that it appeared as a large tumor 1 inch in height and 2 inches in diameter (Fig 620). There was a definite pulsation and marked distention of the veins leading to it from the scalp.

The diagnosis of a pericranial sinus at this time seems to be fairly well established. The possibility however of a meningioma causing the gradual erosion of the bone must be considered. The x ray does not show thickening of the bone however to the

extent that one would expect in a meningioma. The blood-pressure was found to be $\frac{21.0}{9.0}$, but now is $\frac{19.0}{9.0}$. There are no positive neurologic findings.

Operation.—Preparation of the Patient.—In all of our head operations we use the technic of preparation as follows: The scalp is thoroughly shaved over the part to be operated, and usually over the entire surface. The scalp is then cleansed with soap and water and gauze-scrub three times, sterile water, alcohol twice, and then alcoholic solution of mercurochrome. The incision is outlined and draperies applied.

If it should develop that this is a case of pericranial sinus, it will be necessary, perhaps, to remove a large area of the scalp,



Fig 620 —External appearance of meningioma.

and so, in this case, we will outline a double incision, the base of the first over the left orbit, and the base of the second toward the midline on the right side. In this way a good flap can be placed over the bony defect, a flap consisting of the scalp, periosteum, and the outer table of the skull. In this manner one is usually able to give a fairly complete closure. By careful dissection we are now able to elevate the first flap toward this mass, and we come to the margin of the cranial defect. This is seen to be quite sharp along the margin, and a large tumor mass can be felt extending or overlapping the margin of the bone. Evidently the diagnosis in this case is meningioma, and we will now proceed to dissect the scalp free from the tumor mass.

Hemostasis is easily controlled, as you see, and we now have the mass entirely freed (Fig 621) The margin of the bone

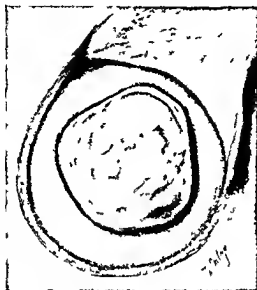


Fig 621 —Meningioma Scalp dissected free from the tumor mass

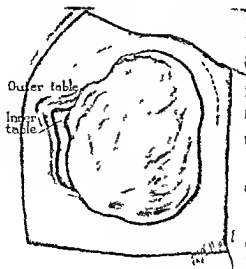


Fig 622 —Mass being separated from margin of skull

can be traced around the entire mass and is felt to be very soft and pliable the two layers being separated as though the tumor mass had attempted to extend between them. In order to ob

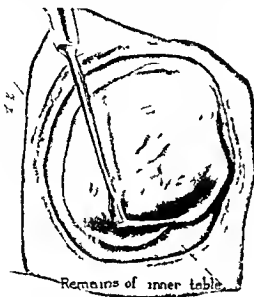


Fig 623 —Mass entirely free

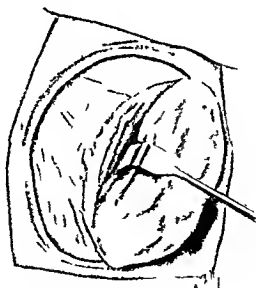


Fig 624 —Retraction of mass from dura

tain normal dura, we will now rongeur the bone from around the entire mass (Fig 622) It is possible now to retract (Fig 623) the tumor mass and by blunt dissection to separate it from the dura (Fig 624) The entire mass has now been removed and one can see that it measures approximately $2\frac{1}{4}$ inches (in its longer diameter), by 2 inches, by $1\frac{1}{2}$ inches It has the typical appearance of a meningioma

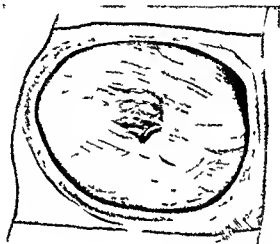


Fig 625—Mass has been removed leaving dural defect with underlying tumor

The dura has a defect, however (Fig 625), which feels as though there is a mass underneath, and so we will make an incision extending outward, and approximately 1 inch, and elevate the flap and see what this mass might be This is seen to be an extension of the tumor mass that looks like a bunch of mulberries, reddish in color, that is entirely separate from the arachnoid and is easily shelled out, leaving a depression in the cortex (Fig 626) We will now close the dural defect as much as possible As you see, this is easily done We will put down the flap and will make no attempt to close the opening in the skull at this time At a later date we will be able to close this defect

These tumors are exceedingly interesting from a histopathologic standpoint. They were formerly classified as dural endothelioma, but from a purely histologic viewpoint the term

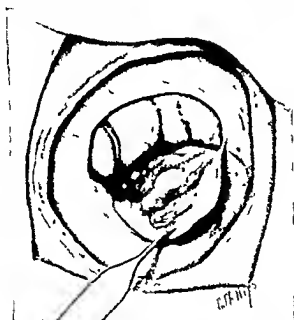


Fig 626 —Dura has been reflected, showing mulberry mass of tumor with cortical depression



Fig 627 —Large extradural and smaller subdural meningioma

"meningioma" is more descriptive and more correct. Endotheliomata may take their origin from the endothelial cells of the liver, bone marrow, lymph-glands, etc. Cushing states that in no

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situation are tumors of this class more common than in the meninges ¹

In an early monograph on intracranial tumors published in 1888 Byrom Bramwell reported a case as sarcoma of the meninges. Looking in retrospect we would in all probability classify such a tumor today as a meningioma. Professor Cleland in 1864 M B Schmidt in 1902 and more recently Cushing and Weed studied these peculiar neoplasms and noted their histological origin. The latter believe that these tumors arise from the arachnoidal cell clusters of meningocytes ²

In 1907 Spiller reported two such cases as angiolithic sarcomata. Bassoe in 1917 reported to the Chicago Pathological Society a case of dural endothelioma ³. Later Harvey Cushing reported on a series of 748 brain tumors of which 80 were meningiomata ⁴. W G Penfield in a series of 420 brain tumors examined at the National Hospital for Paralyzed and Epileptic in London reported a number of these tumors ⁵.

From a histopathologic standpoint these tumors all take their origin from the cells of the arachnoid villi. They may occur within the spinal canal or within the cranium. The work of Cushing and Weed has undoubtedly definitely fixed the point of origin of these growths.

These tumors may never present symptoms. On the other hand Jacksonian epilepsy may be the first indication of an intracranial growth. The vast majority run their course without symptoms until the terminal stage. As a rule headache is absent the nature of the tumor being such that it excavates a nest so to speak in the cerebral cortex by displacement and by the slow erosion of bone the tumor decompresses itself thereby causing no dural tension. Frequently the patient will complain of a slight stabbing or neuralgic pain in the region of the growth. In this case the first complaint was a slowly growing bony mass on the cranium. There are no symptoms of intracranial pressure as a rule.

The x ray will usually reveal in the early stages localized hyperostosis overlying the tumor mass. As the growth increases in size there is gradual erosion of the skull. The cranio

grams in this case will show the change in the size of the cranial orifice over the tumor after an interval of approximately one year

Elsburg and Schwartz have described the radiographic appearance of the diploic veins in relation to the meningiomata. They have found unilateral engorgement of the diploic spaces and veins on the side of the tumor. These authors conclude that in the presence of unilateral diploic engorgement in the general area of the tumor the probabilities are that the growth is a meningioma.⁶

In this case you will note the unilateral enlargement of the diploic spaces especially the large channel leading into the tumor area

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CLINIC OF DR. W. B. HOLDEN

MULTNOMAH COUNTY HOSPITAL, PORTLAND, OREGON

ACUTE INTESTINAL OBSTRUCTION IN A HEALED CASE OF TUBERCULOUS ENTERITIS

BEFORE operation on this case we will give a brief history of her former operations. This will be her fifth laparotomy in the past two and two-third years. Mrs. F. was thirty years old when she first came under our care. She had been treating for tuberculosis of the lungs for one year.

The presence of tuberculous enteritis was found by Dr. Bisaillon, he having referred her to us for an ileostomy. Her first laparotomy—ileostomy—was done under local anesthesia and gas, two years and eight months ago. There was extensive tuberculous involvement of the cecum and terminal ileum. The ileostomy was done proximal to any gross evidence of tuberculosis. Three weeks later, an ischiorectal abscess was opened. Four weeks after the ileostomy, the patient left the hospital. All this time her daily temperature ranged from 98° to 102° F., and her pulse from 90 to 130. At time of dismissal she was considerably improved, though weak and emaciated.

In three months she returned to the hospital, complaining of abdominal pain. Intestinal obstruction was feared, but relief came without operation. This time she remained only five days, her temperature ranging from 98° to 100° F., and her pulse 90 to 120. One month later, however, she re-entered the hospital, complaining of very severe, crampy pains in the abdomen, with vomiting, visible peristalsis, and a blocked bowel. Nothing was coming through the enterostomy wound.

She was operated on for probable mechanical obstruction of the bowel, due to adhesions near the enterostomy wound.

There was no mechanical obstruction but definite well marked tuberculous lesions of the intestinal mucosa were found proximal to our enterostomy. There were a number of these areas some distance above our enterostomy. They had developed since our first operation six months before. We believe that the symptoms of obstruction were caused by a spasm of the ileum at the site of one or more of these comparatively new tuberculous ulcerations. She remained in the hospital two weeks following this—our second laparotomy. Temperature during this visit still remained from 98° to 100.5° F.

Four months later I was called to her home. The patient had been having cramps vomiting and obstipation. She looked bad was in extreme pain nothing was passing her bowels. Visible peristalsis was present. Guided by the information that we had obtained at her last unnecessary laparotomy we gave her a hypodermic of morphin and atropin and her bowels moved promptly. It is the only time I have ever given morphin for pain nausea vomiting blocked bowel and visible peristalsis. She had been confined to her bed for about one year.

About this time she began on her own responsibility to take some secret remedy devised by a veterinarian. For about a year and a half we saw nothing of the patient in a professional way but she reported that she was feeling fine no cough no fever no abdominal pain. She was up and about drove her auto gained in weight and looked to be in fair health.

About four months ago at 6 P. M. she was seized with violent cramps in the abdomen with vomiting and nothing passing through the enterostomy. At 2 A. M. a physician gave her a hypodermic of morphin and repeated it at 9 A. M. At 10 A. M. she was returned to us at the hospital. She was well narcotized with no pain and abdomen moderately distended. There was a tender mass in the right lower abdomen—no visible peristalsis. When patient complained of pain there would appear a tugging on the enterostomy opening. Because we had twice seen similar experiences in this patient without mechanical block we decided to delay operation. Patient was still vomiting at 6 P. M. but very little pain and no bowel movement. At 7 A. M. (thirty

seven hours after the beginning of the pain) we decided to operate. Her white blood count was 21,500, with 95 per cent polymorphonuclears.

At operation (her third laparotomy) we found that nearly one half of her small intestines had slipped around the ileostomy spur, completely obstructing the intestines. This was not an unnecessary laparotomy, though it might have been prevented if, at our first operation, we had so fastened our ileostomy spur that there could have been no chance for the intestines to slip between it and the lateral wall. At this operation it was found that there was no evidence of tuberculous ulceration of the ileum, and that the tuberculous cecum was shrunken and no active tuberculosis present.

She remained in the hospital eighteen days. When she left, her temperature was 98° to 99° F, and pulse in the 80's and 90's. Two months later she returned for resection of the cecum and closure of the enterostomy (her fourth laparotomy). This was done by resecting the cecum and making an end to end anastomosis between the ileum and colon at the hepatic flexure. Her convalescence was without incident. She left the hospital in fifteen days, temperature 98° to $99\frac{1}{4}^{\circ}$ F, and pulse 70 to 90. Four days ago she went home.

Yesterday, at 10 A. M., patient had severe abdominal cramps, with vomiting. Bowels had moved earlier in the morning. After pain had begun, she took enemas without results. Pains were crampy and severe, and occurred at three or four minute intervals. She vomited repeatedly. Her abdomen was tender on the right side, with some rigidity present, but the left side of the abdomen was flaccid. Temperature, 99° F, pulse, 112.

Obstruction of the bowel was suspected, and the patient was sent back to the hospital last evening. Atropin (but no morphin) was given. Enemas with pituitrin were tried. A little gas, and a small bowel movement resulted at 11 P. M. last night. Vomiting was frequent all night. At 5 A. M. a little gas was expelled, and patient slept one hour. At 10 A. M. visible peristalsis was noted, and more pain experienced. Patient says this morning that she feels just as she did four months ago when

she had her mechanical obstruction. We believe that we are dealing with an obstructed bowel very nearly if not quite complete. It is possible that we may find this obstruction at the site of our anastomosis. However we make very little effort to determine position or cause of the obstruction. It is quite sufficient to know that obstruction exists. Its nature and location can be quickly recognized after the abdomen is opened. Because of the numerous operations we have done on this patient we have been a bit tardy in instituting surgery. This is her fifth laparotomy in the last thirty two months.

Before we prepare her for operation you will note the expression of great suffering on her face. This is especially marked every few minutes when she has her pain. On the right side of the abdomen you will notice a little rigidity and some tenderness, which may be due to the pathology in the abdomen, or the recent abdominal scar and anastomosis just beneath. Note that the left side of the abdomen is flaccid and not tender. If you will watch carefully with me you will see the peristaltic waves pass over the left side of the abdomen. We do not see peristalsis in all cases of obstruction. If the abdomen is fat or the muscles rigid you will not see it. Visible peristalsis may be demonstrated in more than one half of the cases. When seen in conjunction with colic vomiting no fever and fruitless enemas the diagnosis is reasonably certain.

You will notice that we have given this patient no morphin, and no cathartics. Cathartics are useless and harmful in their action and morphin equally so by obscuring symptoms and thus causing delayed operation. These two drugs are responsible for three fourths of the operable obstructed deaths. We prefer to operate the first twelve or twenty four hours of the obstruction. This patient has gone twenty seven hours. The death rate should be well under 10 per cent. Any mortality over 10 per cent is due to mismanagement before operation, rather than to poor surgery.

We will use general anesthesia (gas and ether). We are now making a long right rectus incision, which extends from near the pubis to 3 inches above the navel. Note the

distended dark red, small bowel. The anastomosis is, apparently, all right. Considering that this patient has had four abdominal operations in the last thirty two months (two of them in the last four months), we find only a few adhesions. The intestines are removed from the abdomen. They are kept warm, you see, by constantly adding hot salt napkins. This step in

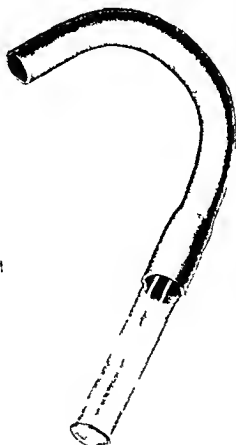


Fig. 628.—Three quarter inch test tube with $1\frac{1}{2}$ feet rubber tubing.

the operation has been criticized as causing shock. There will be little or no shock if the intestines are kept warm and no tension is made on the mesentery. (Here you can see is a single band of adhesions which kinks the bowel near the middle, I judge of the small intestine.) There is a complete block. Note the distended red bowel above this point, and the collapsed,

pale intestine immediately below this band of adhesions. The higher up the obstruction the more rapidly fatal. So this case without operation would be doomed to an early death. This band of adhesions is severed. Our obstruction is relieved, but should we stop now this woman would have a very stormy convalescence. She would have much vomiting and gastric lavage would be required every few hours for two or three days, and her chances for recovery would be considerably less. We feel that the bowel contents above this point of obstruction are toxic. At any rate clinically patients do much better if this



Fig 629 —Purse string linen suture in place

imprisoned material is removed. We will quickly and completely remove these bowel contents in the following manner.

We use an ordinary $\frac{3}{4}$ inch flanged test tube. We have cut off its closed end and slipped on a piece of rubber tubing, $1\frac{1}{2}$ feet long (see Fig 628). Next in the sound bowel, a short distance below the obstructing band we place longitudinally a Lambert strong linen suture (Fig 629). The intestine is opened longitudinally and the flanged end of the test tube is inserted into the bowel (Fig 630). The purse string linen suture is

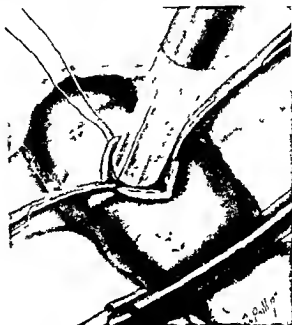


Fig 630 —Inserting flanged end of test tube into bowel There should be shown another intestinal clamp proximal to the tube The proximal clamp is removed as soon as the linen suture is tied

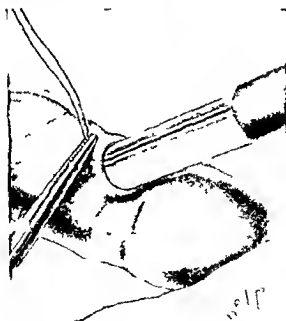


Fig 631 —The first turn of the knot in the linen purse string suture is tied and clamped with a hemostat

drawn taut. The first loop only of the knot is tied, and the ends of the suture caught close to the bowel with a hemostat (Fig 631) The intestinal clamp we have been using on this small loop to prevent soiling from both proximal and distal ends of the bowel, is now changed to obstruct the intestine just below our test-tube The rubber tube is given to the nurse to



Fig 632 —The intestines are being strapped through the fingers of the left hand The right hand is straightening out the coils of intestine to facilitate the passage of the bowel contents to the tube

direct the flowing contents from the bowel into a pitcher. We formerly used a long rubber tube reaching to the floor, but we found that siphonage would strongly suck into the test-tube the wall of the intestine opposite the enterostomy opening But by using a short tube ($1\frac{1}{2}$ feet long), and instructing the nurse to hold the tube nearly horizontal, this difficulty is avoided

I now anoint my gloved hands generously with sterile vase-

line We find the upper end of the jejunum as high as possible Dr Moran quickly, but gently, pulls the intestine through my anointed fingers, thus stripping out all the material in the

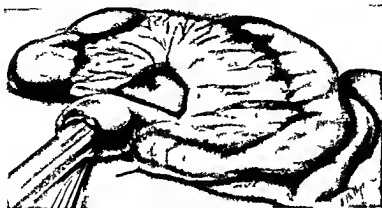


Fig 633 —Intestines flat after being stripped through the fingers

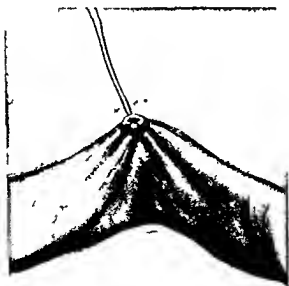


Fig 634 —The test tube has been removed and the purse string linen suture drawn tight thus closing our enterostomy opening

bowel (Fig 632) This runs freely through the rubber tube into the pitcher We will go over this stripping process again Note that the bowel now is collapsed and ribbon shaped

The nurse has collected about 1 quart of rather foul-smelling liquid material. In cases of longer standing and obstructed lower, we have recovered 3 or 4 quarts.

The anesthetist reports that the patient is in good condition. This morning the patient's pulse was 110 and 120. It went up to 128 during our manipulation of the bowel, there being very little, if any shock.

We replace the bowel into the abdomen. By lifting the test-tube we angle the intestine. Now, we will remove our hemostat (Fig 633), loosen the purse string suture, lower the proximal end of the test-tube from its flanged end, and draw up the linen suture (Fig 634), and we have our enterostomy wound closed. A second running Lambert suture completes the closure. We shall not close the abdominal wound without drainage. This operation appears to some as rough and formidable. Our manipulations have been gentle. There has been no shock. It has been only twenty-five minutes from the time of making the incision until the wound is closed. The five or ten minutes consumed in emptying the intestine were probably saved in the ease with which we were able to close the abdominal wound.

Later the patient did not vomit once following operation, in fact, convalescence was uneventful.

CLINIC OF DR SUMNER EVERINGHAM

HIGHLAND HOSPITAL, OAKLAND, CALIFORNIA

PHARYNGO-ESOPHAGEAL DIVERTICULA

Case I.—Mrs A J, age fifty three years Admitted to Highland Hospital May 3, 1927, complaining of pain and difficulty in swallowing Patient admitted having had a cough

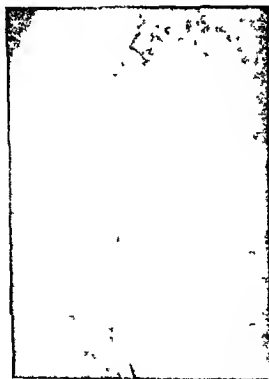


Fig 635 —Case I Pharyngo esophageal diverticulum Lateral view

for the past twelve years, still she had been active and vigorous until three years ago, when she fell down a flight of stairs, fracturing her left clavicle From that time she had had difficulty in swallowing, especially solid food which seemed to

stick in her throat and at times came back in her mouth. She had considerable heart burn and believed there had been some change in her voice. At the outset even taking of fluids caused sensation of strangling so that she would cry out with pain. Gurgling sensation in the throat had been more of late than formerly. She had not lost weight.

On examination patient was seen as a well developed well nourished woman fifty three years. There was little remark



Fig. 636 —Pharyngo esophageal diverticulum. Anterior and posterior views.

able in the physical examination except that when given fluids there was a gurgling sound in the neck but no visible mass was either seen or felt. The laboratory findings showed a negative Wassermann, normal blood count and hemoglobin, urine negative. X-ray showed under the fluoroscope a bilocular esophageal diverticulum extending to the sixth and seventh cervical vertebrae.

Preoperative preparation consisted of restriction to fluid diet.

for twenty-four hours. She was encouraged to take more fluids than normally, particularly orange juice.

Operation was done in two stages. Local anesthesia of procain, 1 and 0.5 per cent was used in each, direct infiltration along the anterior margin of the lower half of the left sternomastoid muscle as well as the upper cervical nerves on either side of the neck as they emerge on the anterior cervical fascia and longus colli muscle. This was quite successful, and dissection



Fig. 637.—Pharyngo esophageal diverticulum Anterior and posterior views

was made without discomfort. In the approach the only vessel of consequence ligated was the inferior thyroid that was divided between ligatures. The diverticulum was readily identified, issuing from the posterior aspect at the level of the cricoid. This was dissected free and threaded through a moderate-sized Penrose drain, the proximal end of the drain being sutured about the neck of the sac. A second rubber-drain was inserted, carried to

the lower angle or space leading to the mediastinum and the wound closed in the usual manner. On the sixth day the second stage was done during which the local infiltration was supplemented by a few mmutes of gas when some traction was put on the diverticulum. The sac was readily identified isolated and a purse string suture carried around the neck before removal reinforced with a second line of chromic gut after amputation. The patient made an uneventful recovery and was discharged from the hospital on the fifteenth day.

Case II—A man forty eight years railroad conductor admitted complaining of trouble in swallowing. It was stated that he had had a cough for a period of six years accompanied during the last two with rather profuse expectoration so marked that he had been forced to keep the window of the caboose open on account of frequent spitting. About one year ago began to have pain on swallowing so that he limited his food to semi solids and had not eaten meat for twelve months. His tonsils were suspected and later all teeth were removed as a possible source of the trouble. He spoke of a gurgling sound or crackling on ingestion of food that had become so marked that he was embarrassed to enter a restaurant for a meal. Large quantities of water were needed to wash down food and prevent sensation of gagging. On lying down and during the early hours of rest he had gurgling sounds in the throat as if he were being strangled. His family thought he had lost some weight.

Physical examination yielded little that was remarkable no mass could be felt in the neck. On fluoroscopic inspection the barium could be seen entering a pharyngo esophageal diverticulum extending downward to slightly below the sternal notch.

Operation was done in the preceding manner under local anesthesia—the second stage performed on the sixth day following. The patient made an uneventful recovery and was discharged on the fifteenth day.

Discussion—Interest in pulsion type of diverticulum centers mainly around a few points namely etiology difference in sequence of symptoms and treatment.

It is not unreasonable to assume that this type is of hernial origin, the mucous membrane issuing from a defect in the musculature on the posterior surface, between fibers of the inferior constrictors. Apparently, as the first case brings out, swallowing dysfunction or lack of neuromuscular control causes a "pinch-cock" action exerting great pressure against the weak spot in the posterior wall. The unyielding cervical fascia and prevertebral muscles, together with the fact that the esophagus



Fig. 638—Case II Pharyngo esophageal diverticulum Lateral view

is placed slightly to the left, tends to point the sac to the left side of the neck where it may attain considerable size. Lilienthal quotes one that had a content of $1\frac{1}{2}$ liters.

Variation in symptoms has been attributed to difference in the size of the sac. While in the main this may be correct, still there are other factors that have a bearing. The two reported above were much the same size at operation, yet the clinical signs were different. It is felt that the aperture or foramen at

the lower angle or space leading to the mediastinum and the wound closed in the usual manner. On the sixth day the second stage was done during which the local infiltration was supplemented by a few minutes of gas when some traction was put on the diverticulum. The sac was readily identified isolated and a purse string suture carried around the neck before removal reinforced with a second line of chromic gut after amputation. The patient made an uneventful recovery and was discharged from the hospital on the fifteenth day.

Case II—A man forty eight years railroad conductor admitted complaining of trouble in swallowing. It was stated that he had had a cough for a period of six years accompanied during the last two with rather profuse expectoration so marked that he had been forced to keep the window of the caboose open on account of frequent spitting. About one year ago began to have pain on swallowing so that he limited his food to semi solids and had not eaten meat for twelve months. His tonsils were suspected and later all teeth were removed as a possible source of the trouble. He spoke of a gurgling sound or crackling on ingestion of food that had become so marked that he was embarrassed to enter a restaurant for a meal. Large quantities of water were needed to wash down food and prevent sensation of gagging. On lying down and during the early hours of rest, he had gurgling sounds in the throat as if he were being strangled. His family thought he had lost some weight.

Physical examination yielded little that was remarkable no mass could be felt in the neck. On fluoroscopic inspection the barium could be seen entering a pharyngo esophageal diverticulum extending downward to slightly below the sternal notch.

Operation was done in the preceding manner under local anesthesia—the second stage performed on the sixth day following. The patient made an uneventful recovery and was discharged on the fifteenth day.

Discussion—Interest in pulsion type of diverticulum centers mainly around a few points namely, etiology, difference in sequence of symptoms and treatment.

MULTIPLE INTERNAL BILIARY FISTULA

A WOMAN aged fifty nine recently entered Highland Hospital, complaining of pain and gas in the upper abdomen. She had had discomfort in epigastrium over a period of six years gnawing in character not radiating to back or shoulder, but extending downward toward the cecal region. There had been considerable distress on ingestion of food so that almost anything caused her to belch gas although she obtained some relief from baking soda or hot water. She had noticed fats caused most discomfort. As far as remembered she had not been jaundiced or had violent chilly sensation. Nausea and vomiting had been noticed, no tarry stools nor had they been clay colored. Present exacerbation began three weeks ago, during which she had had a particularly distressful time, even fluids being badly borne. Night sweats were noted. No outstanding jaundice, although she stated urine was very dark in color.

On admission she was thought to have a slightly "muddy" skin and while active mentally, looked toxic. Temperature on admission was 101° F, pulse normal. Very definite tenderness that extended downward over McBurney's area was present over the gall bladder region. Liver edge not felt below costal margin, spleen not palpable. Heart enlarged to left as well as right. x Ray showed shadow extended to the left axilla. No murmurs, blood pressure 138/105. Hemoglobin 74 per cent and leukocytes numbered 14,600. Wassermann was reported negative. Urine showed nothing remarkable. Icteric index, 2.5. Stool examination negative for evidence of parasites. Roentgenologic examination after intravenous injection of tetraiodo phenolphthalein failed to show normal gall bladder shadow.

Under gas ether anesthesia section was done through the upper right rectus muscle. The gall bladder was found adherent to the anterior abdominal wall a large stone having ulcerated through the peritoneum at the fundus and in separating the

densely organized adhesions fistulous openings were found between the fundus and the transverse colon and still another between the gall bladder and duodenum. Both of these were estimated to be about 1 cm. in diameter. Bathed in about 30 c.c. of pus were a series of calculi that completely filled the cavity of the gall bladder the walls of which when sectioned proved to be 2 cm. thick in places. The gall bladder was removed the openings in the duodenum and colon closed with a double row of sutures. Two good sized Penrose drains were inserted and the wound brought together in the usual manner.

Convalescence was somewhat stormy. On the fourth day the drainage was noted as fecal in character although patient's general condition was satisfactory. Suction was instituted for the treatment of the fecal fistula and beside keeping the patient clean and comfortable hastened the spontaneous closure of the opening. The abdominal wall held firm and she was discharged at the end of the fourth week.

Discussion.—As Naunyn has pointed out fistulae of the gall bladder have long been noted particularly the external or those perforating the anterior abdominal wall. This type of course was not infrequent in the previous decades when cholecystostomy was in vogue.

Internal biliary fistulae are apt to cause no symptoms for as is evident the lesion may be spontaneously relieved by passage of stone as well as continued drainage through hollow viscus. It has been noted however that frequently the openings subsequently close unless there is obstruction of the common duct. Fistulae are reported between most all the viscera of the abdominal cavity and thorax in all yielding little variation from the incident noted by Naunyn. In his series of 384 cases 184 were communications through the abdominal wall 108 with the duodenum and 50 with the colon.

CLINIC OF DR. J. TATE MASON

MASON'S CLINIC, SEATTLE, WASHINGTON

A CASE REPORT OF AN UNUSUAL COMPLICATION OF A DERMOID CYST OF THE OVARY

Mrs M G , age fifty-eight years, was admitted to the clinic on April 6, 1927, complaining of diarrhea, insomnia, weakness,



Fig 640—Sac of cyst Showing the two teeth which protrude through wall of sac and into bowel

and nervousness Her family history was essentially negative, except that her husband died with a dilated aorta at sixty-one years of age She had given birth to three normal children, the

youngest now twenty one years old. Menstruation began at sixteen years and was normal in time amount and duration.

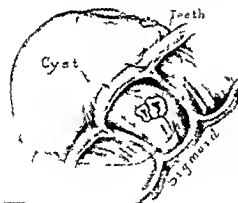
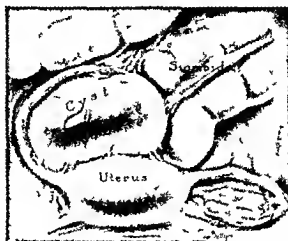


Fig. 641.—Section of sigmoid from posterior view showing teeth projecting through wall of cyst and into lumen of the sigmoid.

until the menopause which occurred with no disturbance at the age of fifty one. She had had a few slight attacks of tonsillitis

in childhood, but had suffered no other serious illnesses. During the first week of January, 1927, she had an attack of influenza which kept her in bed only three days, but she remained weak and nervous, and has slept poorly since this attack. Three weeks before coming to the clinic she noticed that her abdomen was moderately distended, and that there was considerable gas after heavy meals, with a dull, aching pain in the right lower quadrant, especially on stooping. She was often awakened at 2 A. M. with such a pain, and was relieved by a bowel movement. For two weeks before coming to the clinic she had from four to eight semisolid stools a day. No blood was noticed in the stools.

Examination showed a woman 5 feet, 4 inches tall; weight 177 pounds. She was moderately stupid, and had an irritable



Fig. 642 —Radiogram showing a typical cuspid and bicuspid with pulp chamber. Teeth are adhered by fusion of the cementum.

disposition. The systolic blood-pressure was 140, diastolic, 90; the pulse-rate was 80; temperature, 98.8° F. Her teeth were replaced by plates. The abdomen was slightly distended, and there was moderate tenderness over the sigmoid region. The other physical findings, except for the proctoscopic examination, were essentially negative. Hemoglobin was 80 per cent.; leukocyte count 8400, and the urine examination and Wassermann test on the blood were reported negative.

On proctoscopic examination there could be seen in the right wall of the rectum, 7 inches from the anus, a mass about 1 inch long and $\frac{1}{2}$ -inch wide, irregular in outline, of stony hardness, and clicking against metal. The base and pedicle of this were an easily bleeding mucous membrane, not definitely ulcerated. A curette hooked above the stone brought it into the end of the

proctoscope, but it could not be dislodged easily and the operator thought it inadvisable to exert enough traction to tear it from the bowel wall. The proctoscope was passed 3 inches above the mass but no further pathology was noted.

The x ray department reported a stone in the sigmoid.

On the following day, still thinking the stone a calcareous deposit of fecal origin, we attempted to remove it rectally with a specially devised snare. We were prepared to do a laparotomy and did so immediately on finding the mass too firmly fixed to the wall of the rectum to be removed otherwise. On opening the abdomen we were surprised to find a dermoid cyst of the right ovary, the size of a large orange, lying in front of and adhering to the sigmoid bowel, and well above and in front of the uterus. Hair could be seen through the capsule of the cyst. The cyst was ruptured in the removal and was found filled with a substance not unlike wet meal. A small piece of the sigmoid bowel had to be removed with the sac of the cyst. The stone like mass projecting into the rectum and attached to the cyst, was found to be about 1 inch long and a $\frac{1}{2}$ inch in diameter. The outer portion consisted of a calcareous deposit which crumbled away easily leaving two well formed teeth, a bicuspid and a cuspid. The teeth were fused together, with their incisal edges projecting into the bowel. A radiogram made on a dental film showed root canals in each of the teeth.

Two stones were palpated in the gall bladder. The history was reviewed with the patient after the operation, but no evidence suggestive of gall bladder disturbance could be obtained.

The patient developed a mild thrombophlebitis in her left leg on her fourteenth postoperative day. The convalescence otherwise was uneventful.

RADICAL AMPUTATION OF THE BREAST, DONE EXCLUSIVELY WITH THE CAUTERY. REPORT OF THREE CASES

DURING the past three weeks we have performed three radical amputations of the breast, employing exclusively electric cautery. We have been fortunate this summer, in having a large number of distinguished surgeons visit our clinic. A patient with cancer of the breast came for operation while Dr. A. C. Scott, Sr., of Temple, Texas, was a visitor here. I had had the pleasure of hearing Dr. Scott read his paper on "Glandular Block Dissections for Metastatic Cancer," before the Section on Surgery, General and Abdominal, at the seventy sixth annual session of the American Medical Association at Atlantic City, N. J., in May, 1925. In this paper he reported more than 700 cases of cancer in which the cautery was used for excision. His statistics were better than any that have been previously presented. After a good deal of persuasion Dr. Scott consented to operate upon our first patient before a small group of friends. This operation was the most beautiful I have ever seen. His technic was good, and his method of handling the whole situation was so sane that we have decided from now on to follow his ideas as closely as possible. In the 3 cases that we wish to report, plus the one operated upon by Dr. Scott, the electric cautery was used exclusively.

The following are some of the points in the technic of the cautery operation. The anesthetic has to be considered when using the cautery. Ether and ethylene cannot be used because of their explosive qualities. In our first two cases nitrous oxide and oxygen and in the third case, nitrous oxide and oxygen plus a small amount of chloroform were used. While we are not enthusiastic over chloroform anesthesia, in trained hands it is not dangerous.

The ordinary bevel edged cautery which is used in excision of the stomach intestines or appendix is employed except that the cautery points are filed until they have a rather sharp beveled edge. It is astonishing if one has not tried it, to see how thoroughly the axilla can be dissected with this type of cautery. The axilla is dissected with the point at a dark red color. With thumb forceps the fat is pulled slightly away from the blood vessels and then with a sharp quick stroke of the cautery the fat and glands are separated from the large vessels. An assistant controls the cautery constantly keeping his eye on the point. As the skin incision is being made the cautery must be at white heat if primary union of the skin is desired.

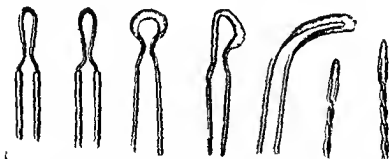


Fig. 644.—Different types of cautery.

As the cautery cools quickly in the skin short quick strokes are made. The cautery should return to a white heat at the beginning of each stroke. If one would hum very slowly *Home Sweet Home* and at the beginning of each bar make a short quick stroke with the sharp bevel edged cautery primary healing would occur.

The postoperative recovery of these patients has been a revelation to us. Not a single one has had to have a dose of morphin. They have complained of no pain. The wounds have all healed kindly. In the first two patients the incisions were closed without drainage. In the third an interscapulothoracic amputation of the shoulder was done requiring a very extensive incision and yet only one small cigarette drain was placed in the

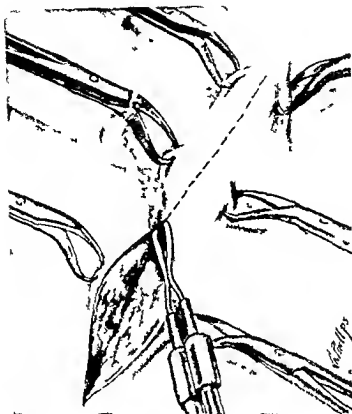


Fig 644—Incision in skin with cautery at about 2500 degrees

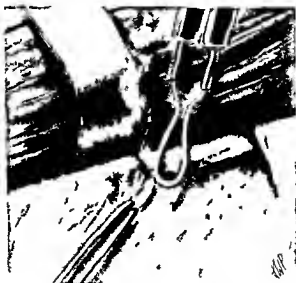


Fig 645—Dissection of vessels with cautery

lower part of the wound. There has been a slight discharge of serum in each case but not as much as we have seen following our old operative technic with the scalpel and scissors. We will keep accurate records of these cases, so that within a few years we will be able to compare them with the records of patients operated upon by other methods. I am taking the liberty of reprinting an extract of the paper read by Dr. Scott at the Atlantic City meeting. By comparison you will note that his results are better than those who have employed other operative technics.

CONDITION IN CAUTERY GLAND DISSECTIONS FOR CANCER
OF BREAST THREE YEARS OR LONGER AFTER OPERATION

	Operated on	Local recurrence	Died from distant metastases	Died from other causes	Well	Percentage of three year cures
Patients	30	0	8	1 cerebral embolus	21	70
Glands involved	18	0	8	1 cerebral embolus	9	50
No glands involved	12	0	0	0	12	100

FIVE YEARS OR LONGER

Patients	11	0	3	0	8	72.7
Glands involved	5	0	3	0	2	40
No glands involved	6	0	0	0	6	100

SUMMARY OF BREAST CANCER

	Three year cures per cent	Five-year cures per cent
Jacobson Ohio State Med Jour 14 639 1918	32.8	23.7
Handley Brit Med Jour 1 37 January 8 1921	48	
Buchanan Pennsylvania Med Jour 1918 p 263	38	73.5
Lee B J Amer Jour Roentgenology December 24 p 535		15
Sistrunk Ann Surg 65 63 1922	51.8	39
Scott	72	72

The following are some of the points Dr. Scott emphasizes, which are taken from his article of 1925

1 All tissues must be held on tension as the cautery approaches them, i. e., perfect retraction is absolutely essential

2. The cautery must be applied in strokes that are short and quick.

3. Perfect control of the cautery heat is best attained by a trained assistant who has no other duty to perform.

4. The cautery must be heated to suit the different tissues involved.

5. Three distinct differences in heat are essential:

(a) White heat for incising skin when primary union of skin is desired, and for cutting large sensory nerves.

(b) Bright cherry-red for reflecting skin flaps, cutting muscles, and for dissection in general.

(c) Dark red for working close to large blood-vessels and nerve trunks. With this low degree of heat the cautery tip may safely pass within one-sixteenth of an inch of a large vessel, loosening the areolar attachment of its sheath without damage to its wall.

CONCLUSIONS

1. Block dissection of the neck, axilla, and groin for metastatic cancer can be done with an electrically heated, beveled cautery with the following results:

(a) Marked reduction in the amount of blood lost during the operation.

(b) Marked decrease in postoperative pain.

(c) Marked decrease in the number of patients showing any operative shock whatever.

(d) Primary union of skin flaps.

2. Operations done with the technic described, as compared with cauterization as commonly practiced, result in less pain, less shock, and much shorter convalescence.

3. Operations done by this method as compared with operations done with the knife, scissors, or gauze dissection method result in:

(a) Fewer local recurrences in or near the site of operation, and therefore:

(b) A greater percentage of three- and five-year cures.

4. Since the groups of cases here reported contain many

that would ordinarily fall in the inoperable group I feel justified in believing that if this type of technic should be used in only the operable group the percentage of three and five year cures would be still further increased

CASE I

Mrs G K (Case No A 21860) white fifty years of age was first seen in the clinic August 8 1926 She gave the following history A lump was first noticed in the left breast in March 1926 Being painless it gave her no concern until she noticed a progressive increase in size It was for this reason that she sought medical aid For nine months previous she had noticed moderate polydipsia and loss of strength

Physical Examination—Nose and throat thyroid heart and lungs and abdomen were normal Pelvic examination was negative There were many carious teeth Slight varicose veins were present in both thighs There was a firm nodular mass about 3 cm in diameter in the upper right quadrant of the left breast It was firmly adherent to the skin There was no evidence of any involvement of the axillary or supraclavicular glands

Laboratory Findings—A radiogram of the chest was negative The hemoglobin was 85 per cent The white blood count was 6800 Urinalysis showed specific gravity 1040 acid reaction no albumin and 5 for sugar Fasting blood sugar concentration was 273 mg per 100 c c

A diagnosis of carcinoma of the breast and diabetes mellitus was made and the patient was placed in the hospital on August 11 1926

Preoperative Treatment—Control of the diabetes was established by Dr Lester J Palmer On a diet of carbohydrate 50 gm protein 50 gm and fat 125 gm and 40 units of insulin daily the urine became sugar free on the fifth day and the diet was increased to carbohydrate 60 gm protein 60 gm and fat 150 gm and insulin was reduced to 35 units daily The patient was given instruction regarding the figuring and weighing of the diet and the administration of insulin During this period she

was given the preoperative course of radiotherapy. The x ray dosage was 300 ma minutes given at a 16 inch distance using $\frac{1}{4}$ mm of copper and 1 mm of aluminum filter. Three ports of entry were used the breast area the supraclavicular area and the axillary area. The patient was sent home to continue the treatment of the diabetes and told to return in three weeks for resection of the breast. The fasting blood sugar concentration on the day of discharge was 160 mg per 100 c c.

Operation.—On September 8th the patient returned for operation. The blood sugar concentration was 176 mg per 100 c c. The diet was changed to carbohydrate 100 gm protein 60 gm fat 100 gm and insulin was increased to 60 units.

The operation may be described as follows. The lines of incision were established and two rows of towel clips were placed one on either side of these lines so that skin could be held at a tension. With cautery at white heat employing stroke each lasting perhaps less than one fourth second the incision was made. A nurse unrolled a hot wet sponge along the incision just as it was made thus arresting hemorrhage. The bleeder were then picked up by hemostats and sealed by placing the cautery at a cherry red heat on the hemostat just proximal to the vessel. The heat thus transmitted through the hemostat caused enough coagulation of protoplasm to seal the vessels in most cases. On an average however about one out of ten vessels had to be ligated. Special precaution must be used at this point not to hold the cautery too long on the forceps or in contact with the freshly cut surface as either will tend to prevent primary healing. The skin flaps were dissected back and the pectoralis major and minor muscles were divided with the cautery at a cherry red heat. The skin along the line of incision was held on tension and the same type of stroke was used as described for making the skin incision. The glands and fat were dissected from around the large blood vessels in the axilla with the cautery at a dull red heat. By picking up the fat and glands gently with thumb forceps thus causing some tension the vessels may be dissected as cleanly as with a knife and with as little injury. Actual experiment has shown that the cautery

at dull red heat and with quick strokes may be used 1/16 of an inch from the vessel without injury to it. The mammary gland and the median portions of the pectoralis major and minor muscles were then dissected away. The skin flaps now fell together with no tension and were sutured. The subcuticular stitch is used in closure. No drains. The entire operation was performed under gas anesthesia.

The postoperative convalescence was remarkable. The patient had no shock whatever. The highest postoperative temperature was 100.4 F° and the most rapid postoperative pulse rate was 120. At no time did the patient complain of any pain during convalescence nor was there a single dose of opiates given for the relief of pain or restlessness. On the sixth day a little serum which had collected was allowed to drain by opening the lower portion of the incision with a probe. Primary healing took place for the most part. On September 17th and 18th the patient received a second course of x ray treatment employing one port of entry which included the left breast left axilla and left supraclavicular area. The same technic was used as described in the preoperative x ray treatments. The patient was discharged on the fourteenth postoperative day. At the time of discharge she had free motion of the left arm. Microscopic examination of the tumor removed showed it to be carcinoma of the scirrhus type. No microscopic evidence of carcinoma could be found upon examining the fat dissected from the axilla.

One liter of 5 per cent glucose was given per rectum each twenty fours for two days immediately following the operation. There was slight nausea and some vomiting. Ten units of insulin were given every six hours. Because of some difficulty in retaining rectal fluids and because of the nausea a quart of normal salt solution was given subcutaneously. On the third postoperative day some liquid food could be retained by mouth and the glucose was better retained per rectum. On the fourth day soft diet composed of carbohydrate 100 gm protein 40 gm and fat 50 gm was retained by mouth. Forty units of insulin in two doses was given during this period. By the sixth postoperative day the preoperative diet of carbohydrate 60 gm

protein, 60 gm , fat, 150 gm , and 35 units of insulin a day was resumed At no time did sugar or ketone bodies appear in the urine

CASE II

Mrs J J (Case No A 21154), a moderately well nourished, well developed white woman of seventy one years was referred to our clinic by her family physician She was first seen by this physician on September 13th and she gave a history of having noticed a small lump in the left breast about two days previously For at least six weeks she had noted retraction of the nipple There was no pain whatever, and the patient came to the hospital only upon discovery of the lump

Examination showed a hard irregular nodule about 2 cm in diameter, just superior to the left nipple The mass was not tender, and was firmly adherent to the skin No glandular involvement of the neck or axilla could be found

Diagnosis of carcinoma was made and immediate operation advised On September 17th resection was done under gas anesthesia using a sharp, bevel edged cautery The postoperative convalescence was as satisfactory as in the first patient She had no shock following the operation Her temperature at no time during convalescence was over 100° F, nor was the pulse rate more rapid than 102 Several doses of 1/6 gr of morphin were given during two or three days immediately following operation but there is no record of the patient suffering from any pain whatever On the contrary, the nurses' records and interns progress notes show that the patient rested well and slept well during every night She was discharged on the twenty second postoperative day

Microscopic examination of the tumor showed it to be of the scirrhus type There was no demonstrable involvement of the glands of the axilla

CASE III

J J (Case No A 20625), a moderately well nourished woman, sixty one years of age, gave a history of tumor of the breast, first apparent several years ago No attention was paid to it at first but in July 1925, the patient went to a physician who, according

to her story removed a very large tumor under ether anesthesia. He told her that the tumor peeled out easily. However the tumor recurred very quickly so that another operation was performed in December 1925. The tumor removed at this time was even larger than that removed in July. A third operation was performed during the latter part of May 1926 at which time another recurrent tumor was removed. These tumors were painless until about May 1, 1926 when she began to suffer with dull aching pains in the axilla. Microscopic diagnosis made in January 1926 was myxosarcoma.

Physical examination on June 10, 1926 showed old scars in the area of the left breast where various operations had been performed. A subcutaneous nodule about as large as an almond was found in this area and the entire area along the scar was much indurated. When the patient was seen again on October 1st the subcutaneous nodule had disappeared but there were many large intramuscular growths about the left shoulder extending down the arm to about the insertion of the deltoid muscle. During July 1926 another microscopic examination had been made of this tumor and the diagnosis was likewise myxosarcoma.

Operation. On October 2d the patient was operated upon under chloroform anesthesia. The indurated area over the region of the left breast was treated as though the breast were present. Then an interscapulothoracic amputation with a large deltoid flap was performed. The greater part of this operation was done with the beveled edged cautery using as described above, white heat for the skin incision, cherry red heat for the dissection of muscular tissue and fat and a dull red heat for dissection around the large blood vessels. However as the large blood vessels were cut in this case the dull red heat was not used at all. The technic of the operation is roughly as follows. Two vertical incisions with their convexities in opposite directions were made so as to include the indurated area over the region of the left breast then at the upper end of the incision about at the level of the second rib, another incision was made directed toward the sternoclavicular junction from about the

same point another incision was made toward the acromioclavicular junction skin flaps were dissected back with the cautery, and the clavicle exposed at the junction of the inner and middle thirds. At this point the clavicle was cut and the subclavian vessels were exposed and ligated. The pectoralis major and minor muscles were then divided with the cautery, using a cherry red heat. Large white nodular growths had almost completely destroyed the pectoralis major muscle and had completely destroyed the pectoralis minor leaving scarcely a trace of muscular tissue. The median portion of these muscles and the tumorous area included between the original incisions were dissected away by the cautery using cherry red heat. At the lower end of the original incision which was about at the level of the fifth rib another incision was made and carried back to the inferior angle of the scapula with the convexity downward and anteriorly. Now with the arm in an adducted position the incision described above as directed toward the acromioclavicular junction was extended along the anterior border of deltoid muscle and just below the level of the inferior attachments and toward the inferior angle of the scapula. The dissection was continued over the posterior aspect of the scapula thus a single flap was made in the form of an epaulette from the shoulder area. At this stage the arm was held upward by one of the assistants and the scapula was freed from its attachment. Beginning at the inferior angle the latissimus dorsi the rhomboids the levator anguli scapulae and serratus magnus were severed in the order named.

This operation was performed with very little loss of blood and the incision healed by primary intention. The patient suffered little with pain and only two saline infusions of 1 liter each were given one of which was given immediately after the operation and before the patient was awake from the anesthetic and the other the next morning.

We do not for a moment think that we removed all of this very extensive growth but we do hope that we have removed enough so that x ray therapy will retard recurrence.

In this type of operation the following minimum personnel

is required besides the surgeon Two assistants for traction and manipulation of the arm one to adjust the heat of the cautery (he should be on a high bench looking over the surgeon's shoulder where he can see the cautery at all times) and a scrub nurse

The small amount of pain complained of by these patients can not be attributed to their stoicism alone Evidently the heat must have some effect on the severed nerves thus interfering with their normal conduction of the sensation of pain

CLINIC OF DRS J TATE MASON MAURICE F DWYER AND LESTER J PALMER

MASON'S CLINIC SEATTLE WASHINGTON

CARCINOMA OF THE COLON

Clinical Aspects and Diagnosis—Approximately 8 to 11 per cent of all carcinomata are found in the intestinal tract. Only about 5 per cent of intestinal cancers are found in the small bowel while 80 per cent occur in the rectum and 15 per cent in the flexure, cecum and colon.¹ Practically all growths of the intestine are primary in origin and show a markedly small tendency to metastasize as compared to carcinoma elsewhere. However it may occur not infrequently that small malignant growths of the lower colon metastasize early into the liver the secondary growth overshadowing the primary lesion.

Malignant growths in the large bowel are often silent in nature until of considerable size. Therefore the clinician who does not wish to overlook detectable lesions of this nature must give proper weight to seemingly insignificant symptoms and adopt certain method of examination as routine procedures whenever there is the slightest indication of large bowel disturbance. Blood coming from the rectum must not be lightly treated with a rectal suppository. If hemorrhoid can be ruled out by visual observation of the internal and external sphincter region on proctoscopic examination further study must be made. One should not forget that even though hemorrhoids are found and seem to be the source of bleeding they may be secondary to pressure from a growth in the bowel at a higher level. It would be well if digital examination of the rectum were made as frequently during general examination as are mouth or throat ex-

¹ Brown Thomas R. and Guther Ernest H. *Text-Book of Medicine* vol. vii p. 701

aminations This examination is best made with the patient lying upon the back and one of the hands of the examiner on the lower abdomen so that the sigmoid may be forced into the pelvis and counterpressure exerted for the internal finger This gives the bimanual effect and adds greatly to the efficiency of the procedure If digital examination is negative and the complaint makes further study justifiable or if digital findings are positive it should be followed by sigmoidoscopy The procedure is a simple and not an uncomfortable one provided the bowel is well emptied by enemata (usually 2 quarts are given an hour apart) and provided the patient is in the proper position The most advantageous position is one in which the patient practically stands upon his head This position may be obtained on a special table or on an ordinary flat table by using the most exaggerated knee chest position possible for the patient to assume The head must be practically between the knees Proper position causes the sigmoid loop to straighten and the entire bowel to fill with air because of the negative pressure within the abdomen Roentgenologic examination of the colon filled with a barium enema will confirm pathology revealed by the above mentioned methods and will often reveal pathology not shown by other methods

Symptoms —Pain is usually not marked until late Blood in the stool is rather common but not necessarily present Bright blood is more suggestive of colon pathology than is dark blood which usually comes from at least as high up as the small bowel Symptoms of low grade obstruction in the bowel may be the only subjective evidence : *e* more constipation than usual discomfort and failure to obtain results from an enema some loss of appetite slight nausea rarely vomiting except in late cases with complete obstruction unusual cramping after taking a laxative ribbon shaped stools tendency to slight bloating In late cases with complete obstruction all the symptoms of blockage in the bowel are present Rarely is there much loss of weight or evident cachexia in the early cases although some anemia may be present if bleeding has occurred Rather sudden obstruction of the bowel may be the first symptom

Physical Examination.—Tumor mass may be palpated even when no subjective symptoms are present. Repeated examination after thorough emptying of the bowel may be necessary before the tumor is found. Bimanual examination by rectum may locate a mass, and special examination as sigmoidoscopy and roentgenologic study may confirm the diagnosis.

Differential Diagnosis.—Early lesions of the ulcerative type seen at sigmoidoscopy may require differentiation from syphilis or tuberculosis, and inflammatory masses resulting from pericolicitis caused by perforated diverticuli may be confusing. Tuberculosis of the cecum may closely simulate carcinoma.

Statistics.—The files of the Clinic contain the records of 65 cases of carcinoma of the large bowel, collected from among 24,000 registrations. Two thousand nine hundred patients, or 12 per cent. of the total number of people consulting us, had a complete gastro-intestinal examination. One hundred sixty-nine, or 5.8 per cent. of these 2900 patients, had cancer of the gastro-intestinal tract. The location of the carcinomata varied as follows: Esophagus, 17, or 10 per cent.; stomach, 87, or 51.5 per cent.; and large bowel, 65, or 38.5 per cent. Cancer of the large bowel varied in location as follows: Cecum, 4, hepatic flexure, 1, transverse and descending colon, 11, rectum, 28, and sigmoid, 21. In 75 per cent. of the cases of cancer of the large bowel the growth occurred in the rectum and sigmoid.

CASE HISTORIES

The following 3-case histories are selected for citation, because each one seems to bring home a point of importance or a lesson to be learned, urging greater care and thoroughness in the examination of patients whose presenting symptom is disturbance in the function of the large bowel.

Case I.—Mr. J. I. (Case No. A-6068), forty-nine, entered the Clinic March 17, 1921. His chief complaint was of hemorrhoids, which had been present off and on for thirty years. Past and family histories were unimportant.

Clinical History—He has had periodic constipation for years, with considerable gas and pain in both groins during a spell. Piles have been present for thirty years. Bleeding has occurred



Fig 617
Carcinoma of sigmoid
Carcinoma of cecum

Fig 616
Carcinoma of sigmoid
Carcinoma of cecum

only during the past three years and of any considerable amount only on one or two occasions. Constipation has been much more severe of late and laxatives cause considerable discomfort. Six weeks ago upon presentation of this history to a surgeon, a

diagnosis of hemorrhoids was made and operation advised without further examination. At operation, the results of proctoscopic examination were reported as negative and several large internal hemorrhoids were removed. After a convalescence, stormy for the amount of surgery done, the patient left the hospital and remained fairly well for three weeks. Ten days before entrance to the clinic constipation became severe, and at the time of examination an enema was injected only with difficulty.

Examination.—Height 5 feet, 9 inches. Present weight 145 pounds, average 165 pounds. Nose and throat, mouth, thyroid, heart, and lungs are all negative. Blood-pressure is systolic, 128, diastolic, 80, pulse, 80. The abdomen is negative, except for some tenderness across the pelvis and moderate distention. Scars of bilateral, inguinal herniotomy are present. Digital examination of the rectum reveals a mass the size of a lemon, high up in the region of the sigmoid. The Wassermann blood-test is negative. A complete blood count is normal. The urinalysis shows no albumin or sugar, and an occasional pus-cell. The proctoscopic examination shows an annular obstruction in the middle region of the sigmoid flexure without apparent ulceration. Roentgenoscopic study of the colon shows complete obstruction to the inflow of fluid about the middle point of the sigmoid loop (Fig. 646).

Diagnosis and Operation.—Diagnosis of carcinoma of the sigmoid was made, and confirmed the following day by operation. Resection was done. The pathologist reported the microscopic sections of the specimen to be carcinoma.

Postoperative Course.—Permission to tell the patient the nature of the condition was refused by his wife. Deep x-ray therapy was advised. In spite of great urging on our part, only a portion of the first series was taken. Recurrence took place in about one year, and death occurred December 29, 1923, about two and a half years after the resection was done.

Comment.—This case-history impresses upon us the great importance of investigating thoroughly the cause of hemorrhoids. Particularly is this true if constipation is present, and more particularly if the constipation has recently increased in severity.

Digital examination, proctosigmoidoscopy, and x ray study are always a safe routine to follow

Case II—Mrs K H (Case No A 8663) aged fifty five, entered the clinic June 16, 1921 Chief complaint is stiffness of the neck Past and family histories are unimportant

Clinical History—Although subject to migraine all her life she has always been fairly healthy Four months ago stiffness and snapping in the left side of the neck began This gradually became worse with some intervals of improvement until the present time Appetite is good Endurance is poor There has been a loss of weight of ten pounds in six months Careful questioning even after the diagnosis was evident did not elicit any complaint of constipation, abdominal distress, or indigestion Possibly this is explained somewhat by the fact that the patient was a Christian Scientist

Examination—Height 5 feet, 4 inches, weight, 110 pounds at present, average weight 125 pounds There is moderate pallor and evidence of moderate loss of weight Teeth are fairly good Marked crepitus of the cervical spine is evident upon movement of the head The heart and lungs are negative Blood pressure is systolic 160 diastolic, 90, pulse, 112 A movable mass larger than a fist is palpable in the right iliac fossa of the abdomen It is not tender and apparently not connected with the pelvis Pelvic examination is negative Digital examination of the rectum is negative The blood count shows hemoglobin 85 per cent red blood cells, 4,360,000 white blood count 6600 Urinalysis shows a small amount of albumin, and an occasional pus cell Blood Wassermann reaction is negative Roentgen examination of the colon using the barium enema shows a carcinoma located at about the middle of the transverse colon (Fig 648) Roentgenograms of the chest and cervical spine are both negative

Diagnosis and Operation—A diagnosis of carcinoma of the transverse colon was made and confirmed at operation Resection was done The pathologist reported the microscopic section of the specimen to be carcinoma

Postoperative Course—No postoperative Roentgen therapy was given. At present, four years after operation the patient is reported by her daughter to be well and free from bowel symptoms.



Fig. 64B—Case No. A 8603. Carcinoma of transverse colon.

Comment—This case history describes an excellent example of silent carcinoma of the colon and emphasizes the importance of thoroughness in examination regardless of the complaint and clinical history.

Case III—C R C (Case No. A 8887) male aged sixty seven, entered the clinic July 21, 1921. Chief complaint was stomach trouble. Past and family history were unimportant.

Clinical History—Except for considerable gas in the bowels about six months ago, which was less after he stopped drinking buttermilk, the patient was well until eight weeks ago. About June 1, 1921, eight weeks before admission he noticed abdominal cramps and constipation. The appetite has continued good, but

for three weeks he has felt nauseated after eating. He has not vomited, however, until three days ago, unless he forced himself to do so. There is no blood in the vomitus. It is bitter and bile colored. He has lost 15 pounds in weight in eight weeks. Weakness is marked. He has used enemata to empty the bowel. Until three days ago this method seemed to him to be quite effective. For the past three days he has not been able to keep anything on the stomach and no bowel contents are obtained following the enema. No other complaints.



Fig 649 —Case No. A 8887. Carcinoma of descending colon.

Examination —Height 5 feet 10 inches. Weight 110 pounds. Average weight 145 pounds. The teeth show marked pyorrhea. The mouth is dry. There is evident loss of weight and body fluids. The heart and lungs are negative. Blood pressure is systolic 105, diastolic 65, pulse, 66. The abdomen is moderately distended and tense. No masses are palpable. Digital examination of the rectum is negative. A few hemorrhoids are present. A complete blood count is normal. (Later blood counts showed

considerable anemia existing, not evident at first because of the dehydrated condition of the patient) Urinalysis is negative Blood Wassermann reaction is negative Roentgenologic examination of the colon by means of the barium enema shows a carcinoma at the junction of the descending colon and the sigmoid Procto-sigmoidoscopy was not done because of the condition of the patient In view of the Roentgen findings it was not considered necessary

Diagnosis and Operation—A diagnosis of carcinoma of the sigmoid was made, and confirmed at operation Colostomy was done and followed later by resection The pathologist reported the microscopic sections of the specimen to be carcinoma

Postoperative Course—One course of deep x ray therapy was given This patient was reported alive three and one half years after operation but later removed to South America and we have not heard of him since A barium enema one year after operation gave no evidence of recurrence

Comment—This case-history is cited to exemplify the neglect that may be given by a patient to carcinoma in the large bowel Intestinal obstruction may bring the patient to the physician for the first time Blood transfusion, together with preoperative and postoperative infusion of saline and preliminary colostomy, were all necessary to successful resection of the tumor in this case Early diagnosis greatly lessens the operative risk

The roentgenologic aspects of carcinoma in the large bowel will be presented by Dr Dwyer, and the surgical phases of the condition will be discussed by Dr Mason

ROENTGENOLOGIC ASPECTS

The roentgenologic examination of the colon is indispensable in the diagnosis of carcinoma situated above the lower portion of the sigmoid Careful sigmoidoscopic observation of the rectum and lower sigmoid will detect more unobstructive growths than will the Roentgen examination If a malignancy in the lower colon cannot be seen through a sigmoidoscope, the condition cannot be disclosed by the roentgenologist for in cancer of

the large bowel like cancer in other portions of the alimentary canal a persistent filling defect must be present in order to diagnose an organic lesion

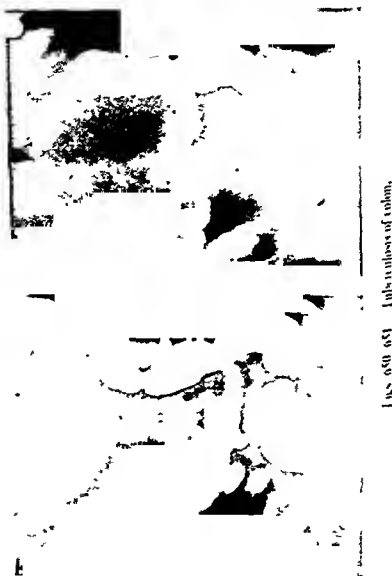
The barium enema is the most satisfactory method of diagnosis when a new growth situated above the lower sigmoid is suspected. The patient is instructed to omit eating or to eat a very light meal the evening before the examination and before retiring to take 1 or 2 ounces of castor oil or $\frac{1}{2}$ ounce of fluid extract of aromatic cascara. The next morning he should empty the colon by means of a soapsuds enema. We believe this preliminary preparation is important as it is possible for a fecal impaction to cause a filling defect simulating a neoplasm. A light breakfast on the morning of examination may be taken if desired. We have discontinued our previous practice of making the Roentgen examination immediately following sigmoidoscopy because on several occasions the barium enema has been unsatisfactory owing to the amount of air introduced into the bowel during the sigmoidoscopic examination. At least a few hours should elapse before the patient is referred for Roentgen study.

Fluoroscopic observation is made while the opaque medium is filling the bowel. The same general roentgenologic principles of careful inspection and palpation are practiced in the examination of the colon as are employed in Roentgen study of the stomach. Failure to turn the patient in various positions in order to unfold a loop of bowel may cause the examiner to overlook a growth. If in doubt always re-examine. It is far better for all concerned to examine a patient several times than to overlook a malignancy or to diagnose one that does not exist.

After the fluoroscopic examination is completed one or more roentgenograms are made on 14 x 17 films. The patient is placed in that position previously determined during fluoroscopic study which will best show the filling defect.

The Roentgen sign of cancer of the colon is the filling defect. This is a persistent localized irregularity of contour produced by the projection of the growth into the lumen of the bowel or by contraction of the infiltrated bowel wall. However not all such deformities signify cancer. Tuberculosis fecal concretions

actinomycosis, appendiceal abscess, diverticulitis when the diverticula are not visualized, extrinsic tumors, and pressure from the spine may all give rise to filling defect suggesting



cancer. Of these conditions, the visualization of diverticula in diverticulitis enables the roentgenologist to make the only differential diagnosis that can be made by roentgenologic evidence alone. Filling defects with or without a palpable tumor

or obstruction involving the cecum and ascending colon especially in people under forty years of age should not be taken too hastily to indicate carcinoma conclusively as tuberculosis is a relatively frequent lesion in this part of the colon. Tuberculosis of the colon that has progressed to the stage exhibiting a definite filling defect is usually associated with tuberculosis elsewhere and a roentgenogram of the chest will generally differentiate tuberculosis from carcinoma (Figs 650-651). The final diagnosis must be based on the correlation of all known clinical and roentgenologic evidence. A roentgenologist must never be swayed by clinical suggestions. This holds true when examining the colon as well as the stomach. He must adhere to a definite routine, take all the time that is necessary to make a satisfactory examination and report his findings exactly as found. Ninety per cent of cancer of the colon should be diagnosed by the roentgenologist. Non-obstructing cancers situated at the flexures especially if the patient is not rotated in various positions in order to unfold the loops may be easily overlooked.

Deformity of contour of the bowel due to extrinsic tumor can practically always be differentiated from a lesion of the bowel. Interpreting a filling defect due to spinal pressure as an intrinsic lesion is not a legitimate roentgenologic error. Spasm may occur in the colon as well as in the stomach and unless the examiner is continually on his guard an organic lesion may be diagnosed that does not exist.

When studying a roentgenogram showing a cancer of the stomach it must be remembered that the growth is always considerably more extensive than the actual filling defect. This is of considerable aid in determining the operability of a given case. Although this same fact holds true for cancer of the colon it does not have such an important bearing because extensive cancers situated anywhere in the colon are not necessarily inoperable as W J Mayo has stated. Metastasis is often limited or absent and attachment to a neighboring viscus if conditions are otherwise favorable does not necessarily forbid operation.

SURGICAL ASPECTS

The ultimate results in patients who undergo operation for carcinoma of the colon have been very satisfactory, as compared with operation for cancer in other regions. A high degree of accuracy in diagnosis of carcinomatous lesions of the colon previous to operation is made possible by careful examination by the internist plus the x ray findings.

In doing colon surgery we should choose the one of several types of operation which is best adapted to the removal of the tumor in that portion of the colon to be operated upon. Functionally and anatomically the various portions of the colon differ markedly from each other. The cecum and ascending colon are more easily mobilized than the descending colon. The contents of the ascending colon being liquid are less septic than those of any other part of the colon. The lymphatic supply is not nearly so free while the blood supply is so constant that the ascending colon offers from the standpoint of infection and recurrence an especially satisfactory outlook.

In malignancies of this part of the bowel the ideal operation is resection in one stage with an end to-end anastomosis or an ileocolostomy. In the end to end or end to side anastomosis we feel that the Parker Kerr method is the best and in each of our anastomoses we have followed this technic.

The anatomical arrangement of the transverse colon which is freely movable except at its extreme ends makes it the most satisfactory part of the large gut for resection. Although we all appreciate that the chances of postoperative difficulty are probably greater than in any other part of the large intestine. First removal of the attachment of the great omentum, which protects the rest of the peritoneal cavity from infection produces an additional hazard. The blood supply is not always satisfactory or constant while the lymphatic drainage is free.

In malignancies in this part of the bowel we are inclined to believe that a two stage operation is practically always advisable. However in one of our cases in which the patient was in excellent condition we resected the growth and did an end to end anastomosis in one stage. An ileostomy was performed in

this case after the resection was completed. A small opening was made in the ileum with the point of a knife approximately 4 inches from the ileocecal valve. A small rubber tube about the size of a No. 10 French catheter was inserted into the opening and passed through the ileocecal valve to the large gut. The ileum was closed over after the manner of Witzel's operation on the stomach. We felt that in this particular case the life was saved by this procedure as there was passage of a considerable amount of gas through the tube for about ten days.

The descending colon has practically no mesentery throughout its entire course with the exception of the sigmoid flexure. The blood vessels do not have overlapping branches in this part of the large gut. The lymphatic drainage is much more free here than in the ascending colon. Due to this anatomical arrangement of blood vessels re-establishment of the continuity of the bowel lumen at a single operation is often dangerous and in each one of our cases involving the descending colon above the sigmoid we have resorted to the two stage operation. In the sigmoid anastomosis can be made over a rubber tube passed upward through the rectum after the manner of Balfour.

The lowered resistance of the patients is the result of dehydration, anemia and intoxication. These conditions play an important part in the mortality unless handled carefully before operation. The dehydration should be taken care of by hypodermoclysis, glucose and if necessary insulin with the glucose. In two of our operations we have resorted to blood transfusion making operation relatively safe in a condition that had previously seemed to have a very hazardous outlook. Intoxication of course is usually markedly improved when the dehydration and anemia have been taken care of. However frequent lavage of the stomach relieves this to a great degree.

Probably the mortality in these cases is more influenced by the degree of obstruction than by any other factor. Rankin¹ states that if the obstruction can be localized to the colon but its site remains undetermined excluding hernia and intussus

Rankin J M. The Choice of Operation in Cancer of the Colon not Including the Rectum. Amer Med Jour. No. 2 vol 85 July 12 1924

ception, there is a six to one chance of its being situated on the left side. It would seem from this that in a man past middle age who has nausea, vomiting and colicky, abdominal pains, we should be very suspicious of a malignancy of the large gut. Miller¹ reports 40 per cent. acute obstruction in a series of cases of cancer of the lower bowel. We have only seen an acute obstruction in one case, although Burgess,² in another series of malignancies of the colon, reports that 35.6 per cent. of his cases had acute intestinal obstruction.

The cause of the severe anemia which we often see in these cases, whether with or without an obstruction, has not definitely been determined. If the growth occurs at a point where the lumen is large and there is no obstruction, we are of the opinion that the anemia is due to direct absorption from the carcinomatous mass, while in other parts of the large bowel where the lumen is smaller and obstruction is more common, it is probably due to the absorption of toxins.

Glandular involvement decreases in frequency from the lower colon upward as follows: Sigmoid first, then descending colon, transverse colon, hepatic flexure, and, last, the ascending colon and cecum. In 100 cases reported by Hays, in which the frequency of glandular involvement was found in this order, the tumor in each case was adenocarcinoma.

¹ Miller, R. T. Cancer of the Colon, *Ann. Surgery*, 78-209 August, 1923.

² Burgess, A. H. The Involvement of the Lymph-glands in Carcinoma of the Large Intestine, *Minnesota Med. Jour.*, 4, 653, November, 1921.

